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The Builder

AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,

SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

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"Every man's proper mansion-house, and home, being the theater of his hospitality, the seate of selfe-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."——SIR HENRY WOTTON.

"Our English word To BUILD is the Anglo-Saxon Bÿlŝan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."——DIVERSIONS OF PURLEY.

"Art shows us man as he can by no other means be made known. Art gives us 'nobler loves and nobler cares,'—furnishing objects by the contemplation of which we are taught and exalted,—and so are ultimately led to seek beauty in its highest form, which is GOODNESS."

VOLUME FOR 1870.

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The BUILDER

Eighteen Hundred and Seventy.

WITH our last number we completed the twenty-seventh yearly volume of the *Builder*, more than twenty-five of which have been issued under the direction of its present conductor. We were then alone. If imitation be, as some have said, the most refined shape of flattery, we certainly have reason to feel flattered. We have pursued our path with heart and will, furnishing an amount of information which may be more rightly estimated looking back through all our volumes, than week by week. Where error needed exposure, or adverse opinions were necessary, we have never flinched from the truth; dealing tenderly, nevertheless, we hope, with those with whom we may have differed. As we have done so we will do. We are too old in the service, and too fully persuaded that we possess the sympathies of our public, to consider fresh professions necessary.

The year 1869 will long remain memorable as having been marked by some of the most remarkable triumphs ever effected by the engineer, the architect, or the builder, since the close of the Great Roman Imperial Period. The strongest impulse given to monumental construction by the pride, the piety, or the military energy of the greatest sovereigns who have arisen in Europe since the Gothic invaders swept away the last relics of the degraded Roman Purple, has never produced, within so short a time, works of such unprecedented magnitude, as the co-operative, commercial, hopeful effort of the decade now closing has originated, carried on, or completed. And while the results of the power and the resolution of those royal and sacerdotal founders who have reared the noblest edifices of Christian times have been strictly and exclusively national, the works inaugurated by the spirit of the age have put a girdle round about the earth. It took a succession of pontiffs, and a series of architects, to rear that mighty dome under the shadow of which 670 bishops are now assembled, in order to perform, if they do as they are bidden, the most comprehensive act of self-immolation which the world has yet witnessed. The Escurial, the Palace of Versailles, the wonderful creations of Mafra—the palaces, the churches and the fortresses, that recall the names of the greatest monarchs who have reigned over the respective countries which those edifices adorn, exert a certain influence on the culture and the convenience of Europe. But the piercing of the mountain barrier that forms the back-bone of the American continent by a railway that brings the Atlantic sea-board into organic relation with the coast of the Pacific, and the cutting through of that thirsty tongue of shifting sand, over which the legislator of the most ancient nation that yet preserves its individuality, though dispersed over all the regions of the earth, led the tribes which he formed into an army and a state, are events which have a direct interest for the entire human race. Mighty as are the changes which even our eyes have seen since Stephenson first turned the escape steam of the boiler into the chimney of his locomotive,—merely to get rid of that superfluous vapour, to the dying energy of which he afterwards found that he was mainly indebted for the speed which his iron horses attained,—they may prove to be as nothing in comparison with those now looming in the future.

The year 1870 opens, indeed, under unusual auguries. The long-continued doubt, suspense, and dismay which have so long possessed the minds of men accustomed to industrial enterprise, seem to have reached a climax. If men are not convinced that great changes are imminent, it can only be because they have lost the power of expectation. At least, it cannot be denied that many long-open questions are now closed or closing; that many sources of hesitation are removed; and that the outcome of a future as to the course of which the past can furnish but little reliable guidance is more and more clearing itself from the mist.

The year 1869 has not fulfilled the hopes and the desires of all those interested in public enterprise by the revival of public faith. On the contrary, so long has been the stagnation following the commercial tornado of 1866 that some of the most hopeful, as well as the most thoughtful, men are beginning to put the question,—Will enterprise ever revive? Have we entered on a secular period in which no man will trust his neighbour? Are our canals all cut; our railways all constructed; our ports and harbours all perfected; our cities enlarged and over-built beyond the demands of their inhabitants; our inventive faculties discouraged and laid up in ordinary, so that there is nothing to be done with any spare money that becomes palpable on squaring up the accounts for the year, but to risk it as an investment in the ever-tempting quick-sand of foreign loans?

It is true that, a few weeks since, a more cheerful feeling was prevalent in the great centre of financial life than we can remember for the past three years. The fit was transient, and the alarm of those who, in busier times, gave life and vigour to speculation, or to whom the paternity of prospectuses might be ascribed has, perhaps, culminated with the arraignment before the Lord Chief Justice of the once fabulously honoured potentates of the discount market. The ringing cheers which welcomed the close of this long-vexed question may, perhaps, have had a more real excuse than the critics of the press have yet allowed. To applaud the clear delivery of justice by a venerable magistrate would be, no doubt, a solecism. To hail the acquittal from a criminal charge of the very men who, a few short months before, were saluted on their provisional committal for trial by every form of execration, and every varied dissonance of catcalls, appears, at the first blush, but a fresh example of the unreasoning caprice of the mob. And yet a deeper and not altogether reprehensible feeling may have sought an instinctive vent in both the groan and the cheer. That enforced idleness, which is worse than almost any sacrifice of the fruits of past toil, found voice on the former occasion. On the latter, it is far from improbable that the hope that with the clear statement of what the law of association really covers, and with the destruction of all vague theories on the subject, the uneasiness which has caused such long paralysis might be relieved, may have elicited a very hearty cheer from men to whom the individual fate of the directors of the Limited Discount Company was a matter of comparative indifference.

In speaking of the financial disaster of 1866, we took occasion to remark that its consequences would be unprecedented. Unfortunately, that remark has been fulfilled, in perhaps the most trying mode that is possible, by the long persistence of mutual distrust. Men have doubted not only one another, but the law itself. The latter doubt is now, in great measure, set at rest. In what shape enterprise will present itself, so as to guard at once the promoter and the subscriber, is not yet clear. Such a method of management is now the great desideratum. Judging from the tendency of all the recent changes in the laws that regulate credit, it may be thought that the two features which must be prominent in any such digested scheme that shall command public favour in 1870 are,—on the one hand liability actually limited, by the issue of low-priced shares, fully paid up in the first instance; and, on the other hand, by the guarantee of the known personal honour, skill, and integrity of an efficient manager, or of two or three efficient committee-men, whose functions, with respect to the manager, shall resemble those of auditors. In fact, an adaptation to our own

habits of the Continental system of the *Société en Commandite* is that which appears to us to be called for at this moment. It may be long before the exact method of obviating the dangers which now deter men from all joint-stock enterprise is hit upon. Once found, however, there is little room to doubt that the disposition to make use of it will be so developed as to change the face of affairs, and restore activity, at any rate, to Great George-street.

In the meantime the facilities for conducting business of all sorts in the metropolis have, during the outgoing year, been notably increased. The transfer of the telegraphs to Government, which, though not yet accomplished, has been legalised within the period under review, can hardly fail to give a great stimulus to business of every description. The opening of further sections of the Metropolitan Railway has tended to enlarge the area available for business residence, and to economise the time of all those who reside in the localities served by the circular route. From Westminster to Kensington, and so round to the Edgeware-road, and to the City, the communication is now extremely convenient. The complaints made in our pages as to the bad atmosphere of the tunnels have met with due regard; and, although it is very much to be regretted that the up and down traffic is not led through separate tunnels, in which case good ventilation would be almost or quite effected by the mere passage of the trains, still London derives a great and increasing benefit from the subterranean channel of traffic. The completion of the line to Blackfriars may be expected at no very distant time. The absolute necessity for the continuance of the railway towards the Mansion House, and the Tower, and so round again to Moorgate-street, will become only more apparent when the line is opened to Blackfriars; and the formation of a line from Baker-street to Charing-Cross is one of those *desiderata* the fulfilment of which is only a question of time.

Metropolitan improvement has not been confined to railway extension. We have been active under the sky as well as under the earth. The long-crying nuisance of Holborn-hill has been abated. Making every allowance for any error of detail, a well-considered, adequate, picturesque viaduct has replaced that old Waterloo of the London horse-master, and the flood of traffic now rolls tranquilly over the level platform with an immense economy of time and of cost.

Royalty honoured with its presence the opening of the new Blackfriars Bridge, and proceeding thence, her Majesty was the first to make use of the viaduct over the valley of the Fleet. Together with these two great bridges, the footway along the river Embankment has been thrown open to the public. The too-long delayed works of the Metropolitan Extension Railway have retarded the opening of the river side carriage way, as well as the formation of the park and garden which will reach from Charing-cross to Blackfriars. But even the limited and interrupted promenade which is now accessible to the pedestrian has been a great boon to all those whose business leads them to pass from Westminster to the Temple. While questions as to the architectural proportion of the piers and staircases of the quay-wall will suggest themselves to the man of cultivated taste, no doubt can arise as to the effectiveness of the work in the main. Paris herself cannot boast such a river, wall. We must go as far south as Naples to admire, in the magnificent coast road that fringes that unrivalled bay, a water-side drive and promenade superior to that which London will possess when the Thames Embankment is completed.

A hardly-contested fight, even yet, possibly, undetermined, though we should scarcely suppose so, has raged over the site of the Courts of Law. One regrettable result has been the procrastination of the commencement of the building. Nor, noting the confusion which now appears to exist in certain administrative quarters, between parsimony and economy, can we feel sure what progress even the incoming year may witness in a work so urgently demanded as the erection of a Palace of Justice worthy of the City and the nation. If the time that has elapsed should have given the opportunity for a change in the style of the building, we should find in that a full return for the delay.

In the energetic discussion which has taken place on the above, and some similar subjects, it has been matter of considerable satisfaction to see that the propriety of dealing with architectural questions on architectural principles is becoming, to some extent, recognised by public opinion. Education in matters of taste is somewhat on the advance. On the other hand, we have to deplore a movement in the opposite direction in Government quarters. As if to discredit the efforts made by the more enlightened portion of the press in favour of the establishment of a permanent administrative Department of Public Works, a Commissioner of Public Works has unfortunately taken a pride in saying what would lead to the impression of his own entire unfitness for the office. Let us hope that his acts will be better than his words, and he may even now prove more valuable than his predecessor, Mr. Layard, whose words were a great deal better than his acts. The chief result of his rule was delay in every quarter.

Our readers have, from time to time, been made acquainted with the progress and the never-ceasing activity of the noble educational establishment at South Kensington. The Amphitheatre of London, of which we gave an account,* is slowly advancing towards completion. Preparations for the arcades destined to shelter the permanent International Exhibition are in progress. This artistic and industrial centre, to which access is now readily afforded by the Metropolitan Railway system, is one of the brightest spots on which the eye can rest with satisfaction, in glancing at our public institutions.

We have also to remind our readers of the sharp archæological controversy which arose on the first experiment on cleaning the bronze monuments in Westminster Abbey. The remark of the Dean of Westminster, to the effect that he had a double duty to discharge, that of conservation and that of exhibition, and that the two duties seemed at times to clash, may be taken as a summary of the entire dispute. The work of cleaning has gone steadily on—not, perhaps, without occasional mishaps, but, on the whole, to the advantage of the most regarded of our national sanctuaries.

The past year has also witnessed preliminary steps towards the formation of that great requirement of the City and of the country, a National Armoury. The admirable, though limited, collection of Sir S. Meyrick has been exhibited, on loan, at South Kensington. The very interesting historic series at the Tower of London has been carefully rearranged by the most competent hand; and the director of the South Kensington Museum has embodied in his last annual report the recommendation of the *Builder*, that the contents of these two fine museums should be fused into a national collection, worthy of the name. Even if that be not done, the collection already belonging to the nation should be confided to proper hands,—say those of the gentleman who has just now put it into artistic shape,—so that it may be rightly maintained and judgmatically added to as occasion serves. Unlike some other institutions, it will provide ample funds for its own development.

Glancing from the metropolis itself, we are reminded that the first day of 1870 is to witness the abandonment by the directors of the Brighton Railway of that blind and suicidal policy which has caused such a sensible reduction in their receipts, and against which we have so persistently raised a warning voice. We observe within the present week that the Metropolitan Railway directors have also placarded a great reduction of fares. While the effect of a grasping and selfish line of conduct has been the destruction of legitimate traffic, we cannot be surprised to see, in other directions, attempts to galvanise railway travelling into unnatural activity. Among them must be ranked the schemes, no further advanced than on paper, for tunnels, bridges, embankments, and floating or sunken tubes across the Channel. In dealing with these undesirable follies, the *Builder* used the most unpardonable weapon—the sarcasm of practical truth. Our daily contemporaries reproduced our observations, and some of the advocates of the tunnel schemes attempted a reply which we have little doubt that they subsequently regretted. The subject of proper ferry-boats and proper ports for the French and English traffic is one that now rightly engages attention.

Onward, and Eastward, on the route to India, the temporary railway over Mont Cenis has been blocked up by early snow. The Italian half of the great Alpine tunnel is reported as complete; although the Italian engineers are still driving ahead into the French portion of the work. The degree of accuracy with which, as will hereafter be proved, the line has been run from each end, both as to direction and as to level, will be a matter of the utmost interest to ascertain on the meeting of the headings.

Dropping down the Mediterranean to the mouth of the Nile, the month of November witnessed that which has been the most signal triumph of indomitable energy of which modern engineering can boast. Through good report and through evil report the Chevalier de Lesseps has held on, until the Imperial and Royal guests of the Egyptian Viceroy were able, on the fixed day, to steam from the Mediterranean to the Gulf of Suez. England, of all countries in the world, has the most reason to rejoice that the mistrust of this great undertaking has proved, to so great an extent, to be unfounded. Much, no doubt, remains to be done; but M. de Lesseps has given us excellent reasons for placing some reliance on his word. The expense of dredging, of walling, or of widening certain portions of this marine highway will, no doubt, yet be considerable. But M. de Lesseps states that 80,000 tons of shipping passed through the canal within ten days from its opening. Such a statement is more than a promise,—it is an earnest,—of an adequate income. A profound modification of our marine commerce must follow the general recognition of the capabilities of the Suez Canal.

On the opposite side of the globe, a work of nearly equal importance has been accomplished. The more detailed accounts of the Great Railway across the American continent are such as to confirm our first impression as to the rough and ready mode of its construction. In fact, it rather resembles what we should call a contractor's road than a main trunk railway. Wild stories, too, are told of the construction of many miles of the road in duplicate, in the race between different districts, to secure the Government subvention. But we must remember that in America the railway is the pioneer of civilisation. With ourselves it is the rear guard of social progress—with our Transatlantic cousins it is the van. Indeed, such an enterprise as that to which we refer, may rather be spoken of as the forlorn hope of the settler. We must not forget that there are railways and railways, and that our Parliament-enforced method of building every branch with the strength and dimensions proper for a main line, is a far more wanton waste of money than is involved in the slight and rapid fabrication of a route which will require continual repairs, and perhaps ultimate replacement. Light railways must be made in our own country. Our readers will no doubt remember our repeated observations on this highly important national requirement.

We cannot but recall, with extreme satisfaction, the fact that the Horse Guards have at length given due attention to a subject which, from the date of the battle of Sadowa, has received the unfailing advocacy of our columns. That every soldier should be taught so much of the duties of a sapper as to enable a commander to provide immediate cover from fire for his men, on the moment of their seizing an exposed position, has appeared to us to be a requisite of the very highest national importance. We cannot think that we have regarded the subject too much from the stand-point of the civil engineer. Our labours, public and private, on that subject, have been earnest and persistent, and we rejoice to see that due attention has at last been called to the education of the troops of the line in the exercise of the strictly defensive art of using the pick and the shovel.

Our knowledge of the earliest and rudest stages of the art of the builder has been considerably enlarged, during the past twelvemonth, by the Abyssinian photographs taken by the Royal Engineers under the command of Lord Napier of Magdala. Light as to the character of those megalithic circular buildings which, in our ignorance of the date of the race of their pre-historic builders, we call Druidical, has been obtained by a comparison with the very similar forms of the round Abyssinian churches. In the stronghold of Theodore himself, we have seen that, under the skies of Africa, a hut may be synonymous with a palace.

We must not omit a word of seasonable greeting to Lieutenant Warren (though he seems to us to want good advice also), whose labours, on behalf of the Palestine Exploration Society, have elucidated several points connected with the topography of Jerusalem. At this seasonable time of Christmas, the mind reverts with unusual interest to the most striking of the relics

* See p. 278, vol. xxvii.

exhibited, by this association, at the Egyptian Hall; where, hard by a pile of the stone bullets hurled by the engines of Titus, is to be seen a carved and charred fragment of cedar, a portion of the roof of one of the temple cloisters, if not of that very "Solomon's porch" in which One whose birth we now commemorate walked, when "it was at the feast of the dedication, and it was winter."

Amid all the hesitation of the year, it is refreshing to find that the efforts to give ennobling and improving pleasures to the people have neither flagged nor failed. Day after day, through the week preceding Christmas, the largest halls in London have been densely packed with auditors of the Grand Protestant Oratorio,—the Messiah. And 2,035,000 visitors have, during 1869, passed the turnstiles of the Crystal Palace.

The vital importance of the question of education, both primary and technical, is beginning to be felt. We shall continue to urge it as we have long done. The special education of the architect will, of course, be promoted in our pages,—*cela va sans dire*. So, too, with sanitary reform and the great questions of public health and social economy. The past part played by the *Builder* in these fields is so well known as to render any allusion to its future course in those directions unnecessary.

We must be pardoned for one word more, and that not in the character of the architectural critic, but in that of the journalist. It is simply a matter of due courtesy to acknowledge the frequent citations from our columns made by our contemporaries, throughout the empire, of every political colour, as well as occasionally their comments. It is for no mere personal reason that we refer to the subject, but because we hail the evidences thus afforded of the agreement between views we may have long laboured to express, and the opinions of the most influential members of our great literary guild. A weekly journal does not rely, like a daily paper, on the piping-hot novelty of its intelligence: it is rather as being able to treat those events which come within the scope of its pages with judicious clearness, than as always giving the first hint of the occurrence, that a journal like our own must make its mark. And we rejoice to see those of our fellow-labourers who have to consume the midnight oil for the enlightenment of the breakfast-table of their readers thus distinctly recognising our own, as well as their own, proper province.

The year opens with gravity, yet with solemn hope. The past year has brought us no great national catastrophe. It has done much to clear away the wreck of former disasters. If our horizon is not unclouded, it yet constitutes the brightest part of the political heavens. France is in the throes of revolution, as yet bloodless, demanding the end of personal government. Germany is leaning on her sword, and breathing before she attempts to complete her unification. Rumours of disquiet echo from Russia. Spain has established a permanent "provisional" Government, and has enthroned the *prononciamento*. In Portugal the octogenary marshal Duke of Saldanha—a field-marshal of fifty-five years' seniority, seems threatening to throw his sword into the scales which weigh the absolute corruption of the country. In Italy the usual ministerial crisis continues, with little intermission, and will continue so long as the harpy flock of *impiegati*, military and civil, fatten and rot while consuming the vitals of the country. In almost every instance the foreign fundholder is paid his dividends out of a fresh loan, invented, under some clever name, for the purpose. How long Englishmen will send their money to these foreign quicksands, while we have room for its employment in the application of chemistry and of mechanics to agriculture; in the construction of branch light railways; in the reclamation and working of land; in the utilisation of the wasted wealth of sewage; in the creation and the working out of the many new industries which the advance of science daily renders possible, it is not for us to say. But whatever doubt as to the future there may be room for at home, our island seems a perfect oasis of light and tranquillity compared with almost any other terrestrial region. With stout hearts and cheerful outlook we welcome the year 1870.

Rouen Cathedral.—A monument, in memory of Richard Cœur de Lion, has been erected here in the choir, and his heart has been placed in it.

THE PURPOSE AND PROGRESS OF ARCHITECTURAL SOCIETIES.

THE frequent combination of a number of persons into an associated body, for the purpose of mutual assistance and information in pursuits which could not be so thoroughly carried out by individuals, is (to use a phrase now becoming common) a "note" of what may be called *par excellence* intellectual civilisation. The mere numerical combination of brute force for purposes of attack or defence may, of course, exist in a state of society barely raised above animal life; and combinations for the carrying on of trade to the best advantage do not necessarily imply more than what may be termed a state of physical civilisation, generally entirely self-interested in its origin. But associations for the purpose of mutual information and assistance in intellectual pursuits stand on a somewhat different footing. Not only does their existence imply a far higher mental status of society than any merely commercial union: it implies also a higher moral status, presupposing the recognition of that enlightened and unselfish standard which regards all knowledge and ability, howsoever attained, as something to be used for the good and advancement of society generally, not to be hoarded and made much of by its fortunate possessor as a kind of *point d'appui* for gaining an advantage over his fellows in the race of life. And though, of course, it may be said, and justly, that all which contributes to the general advancement of society contributes also in the end to that of each individual member, and that this is consequently but an enlightened form of self-interest, it may nevertheless fairly be urged in reply, that no such intellectual combination can be efficiently carried out and brought to important practical results, without involving, in the first instance, a considerable amount of individual self-abnegation, besides a notable casting out of the old evil spirit of professional jealousy, one-sidedness, and party feeling, which has been such a sad blot upon the annals of some of those which are specially spoken of as "learned" professions.

So far, then, as the theory of scientific and artistic societies is concerned, their multiplication should be an entirely good omen, auguring an increasing mental activity and an enlightened sense among us of the responsibility of individuals towards society at large. And we should be far from saying that there is not a large proportion, perhaps a majority of such associations, wherein their true scope and value are practically recognised by their members, and which are doing good and energetic work in the general cause. In all probability, in spite of isolated facts having a contrary bearing, this is most especially the case with societies which are rather scientific than artistic, and where the results aimed at, though calling for a high degree of cultivation on the part of the workers, are rather of a practical and physical than of a mental or æsthetic nature. In such societies the gaining of the widest possible information upon all details connected with their special subjects is a tangible and recognised end, almost indeed a *sine quâ non*; and when the success of each individual depends not only upon his own talents, but also upon experience and knowledge beforehand of all the possible conditions under which he may have to work, there is the less room for professional jealousy, and the more inducement for a free interchange of experience, which may be of equal value to all parties. It is when we come to associations which have art as well as science for their object, that we have less reason to feel entirely satisfied as to the extent to which they are really made valuable for the advancement of their members. The objects of an association for the advancement of any art are less tangible and less easily defined than in the case of more purely practical pursuits; besides that artists, proverbially an *irritabile genus*, have more tendency, if not more reasonable ground, for personal rivalry and jealousy of one another. It is one thing to communicate to others facts external to yourself, the knowledge of which is gained by simple observation and experience; it is another thing to place them in possession of your own innate ideas and conceptions, to be plagiarised, possibly, by those who are themselves deficient in originality.

Is it in any degree owing to such a feeling that architectural societies, which in a great measure are, so far as their prospectuses take us, art societies, have done less for the advancement of their special art than is at all proportionate to the extent of the machinery set in motion to that end?

We should be sorry to have to admit the general existence among us of so unamiable a quality as professional selfishness: the feeling which leads a man to be content if he "gets on" himself, without any consideration as to the general advancement in the practice of the profession. That there are instances of this, and that architects are not always unwilling to seize opportunities, at sundry times and in divers manners, for damning each other with (or without) faint praise, must, we fear, be conceded. But a great deal of the practical disunion which exists may be traced also to the prejudices so deeply rooted by the Battle of the Styles, the clamour of which is now beginning to die away in the distance, but which has left its results behind it. Whether from these or other courses, however, there is scarcely that unity either among the architectural societies of the kingdom themselves or among individual members of each society, which we could wish to see, and without which the value of such societies would exist rather upon paper than in reality. Even in the central and leading professional body, where at least we ought to expect a judicial and unprejudiced treatment of the principles and practice of the art which it represents, we had not long since practical proofs of the determination of one party therein to set the battle in array against another, in a manner savouring not altogether of breadth and comprehensiveness of artistic feeling. And with regard to provincial societies, the case is becoming a somewhat common one, so far as we can learn through occasional reports. We had occasion the other day to comment in these columns on the formation of a new Northern society in a district where another already existed. We heard some time since of a Midland society, which, having been formed for two or three years without accomplishing anything, was about to be given up again as a bad job, and was only saved *in articulo mortis* by the heroic undertaking of one or two members to contribute something in the way of communications to meetings apparently few and far between. Whether in this case promise blossomed into performance we never learned. In one large town we hear of two opposition societies, one of which, however, seems to confine its energies mainly to simply existing—*stat nominis umbra*. In another, where a tolerably active association has existed for a good many years, several attempts have been made to get up an opposition society, one of which was, if we were rightly informed, strangled in its cradle by the rash proposition of a *pro tem.* committee-man, that each member should bind himself never to accept a commission from a tradesman; a pinnacle of virtue which the remainder, *nati consumere fruges*, were no wise prepared to mount to. In almost all these cases of divided societies in the same town, or of divisions in one society, it is almost impossible not to conclude that the state of things is the result of feelings the reverse of praiseworthy, either morally or intellectually. Were the real object of all the promoters of such societies the advancement of the art of architecture, and of the dignity of the profession, it is almost self-evident that they would have everything to gain in this object by union, and a great deal to lose by division. But, in fact, the state of things is often very much after this manner:—A is disgusted with that conceited fellow B, who is cutting him out of part of his practice; C, who is a mediævalist *enragé*, and makes designs for devils on blotting-paper, is willing to read papers of his own to any extent; he knows their value; but as for coming to listen to that old woman D, who talks about "principles of art," and who has never read Ruskin, he has something better to do with his time, thank you. E really cannot undertake to meet such men as F and G, who drop their H's; and there are unknown quantities up to X, Y, and Z, who are quite willing to see all societies whatever consigned to the Limbo of Vanity, provided their own solid and comfortable business in arbitrations and surveys be not interfered with; and others, who with great show of professional ardour complain that the society accomplishes nothing, and that it is not worth their while to attend its meetings, forgetting that the very condition of accomplishing anything is the active cohesion and co-operation of all concerned. And so it happens that associations, formed with the best intentions, and with every primary prospect of success, are allowed to lapse into meetings of certain cliques or parties, who run

the same round until they are tired of each other, without benefiting either themselves or any one else.

We have said that, when rightly carried out, the formation of associations for mutual assistance in high-class pursuits is both laudable in principle, and cannot but be beneficial in practice. Nor is there, as we believe, any pursuit or profession more open to advancement by means of such associations than that of architecture. The subjects with which architects are expected to be more or less conversant are now more numerous and varied than ever; and though one man can never really master all of them, it is almost necessary that he should have some acquaintance with all: indeed, it may be said that there is scarcely any branch of knowledge, an acquaintance with which may not at some time or other be beneficial to an architect, whose profession touches at so many points on what is accessory to the comfort or the beautifying of life. It is precisely in furnishing the means of thus generalising knowledge, of gaining experience from a larger area than can be covered by any individual mind, that architectural associations may be made in the highest degree useful; may, indeed, be said to be almost indispensable. But let those who belong to, and those who are engaged in forming such associations, look well to their motives and objects. Projects which have once been found useful sometimes become a fashion, and are imitated inconsiderately and uselessly for fashion's sake. It is wasting time to get up a society merely because another town has one, and you will not be outdone; it is worse than waste of time to set one up out of spite and in a spirit of opposition to other members of the profession. It should be distinctly understood, in getting such an association into work, that its *bonâ fide* object be to facilitate and advance the study of architecture among its members, and raise the status of the profession. To promote friendly intercourse among members of the profession in the same locality is of course an object not to be despised, but not in itself worth starting and sustaining a society for, as an ordinary club would answer this purpose equally; and it is necessary always to guard against allowing an institution set on foot for serious professional purposes to descend to a state of mere complimentary speech-making and dinner-giving. Nor is it sufficient that there should be a series of what are called "papers" following each other at regular intervals. Those who are charged with the conduct of our professional societies should see that what is brought forward is of some practical value; and not allow time to be wasted, and the status of their society to be lowered by the reading of papers written *currente calamo* to supply a gap, and containing, perhaps, ill-digested rambling dissertations on nothing in particular, or on things of no real consequence, flavoured by spasmodic attempts at wit. Architectural wit, we are bound to confess, seems to us for the most part to be of a very watery nature, if we may judge by specimens which have come before us in print and in MS. What is to be demanded of an architectural society is that it should be really made an opportunity for communicating valuable information on the practical subjects of the profession, and for promoting interchange of ideas as to the principles of design in art. The exhibition by members of drawings of the works which they have in progress, or are contemplating, for friendly criticism by their fellow-workers in the same field, might often prove of great value, and even do something towards producing and fostering somewhat more of unity of style and principle among our designs than is now perceptible. And if by such a proceeding, too, any inroad be made upon that hurtful and unworthy feeling of professional jealousy of which we have too often evidence, if architects be got to think that their duty should be not to cut out Smith or Jones, but simply to see that the work is as well done as it possibly can be, and to accept and take into consideration all friendly criticism given with that end, then, indeed, architectural societies will have achieved a great and good work. But they will not achieve this by the formation of cliques and the maintenance of party spirit; nor should they even be permitted to become exclusive advocates, in a party manner, of this or that method of design. Their true object should be to prove all things, and to keep to that which is good; and for such a body to declare themselves bigoted adherents of Gothic or Classic, or any other "ic," is voluntarily to retire from the field where they would be of most use, and to set themselves up as the champions of idle and hastily caught-up fashions, instead of investigating and elucidating the broad and permanent principles of the art which they profess to advance.

THE STATUES OF EASTER ISLAND.

THE account of Easter Island and its statues, as lately told in our pages by Mr. Martin Tupper, in consequence of the arrival in this country of some of the figures,* has scarcely excited so much attention out of doors as it properly calls for. The facts are so remarkable, and the mystery surrounding them so great, that we are prompted to place before our readers all the materials available for forming a judgment on the points in question. By the kindness of Lieut. Harrison, we are enabled to give a sketch plan of the island, a view of part of it, with its marvellous grove of gigantic heads, and a representation of one of the recumbent figures, with the singular tufa crown, to which reference has before been made. To these we add representations, back and front, of the two figures brought from the island, and now in the British Museum.†

Contemplate the broad fact for an instant. Here on this barren island, not thirty miles round, in the midst of the vast Pacific Ocean—an island, treeless, metalless, and foodless, occupied by a few wretched savages, and 2,500 miles from its nearest continental neighbour,—more than 300 of these stone statues, 20 ft., 30 ft., and in at least one case 50 ft. high, some of them standing on long platforms of Cyclopean masonry, have been counted, and how many more there may be in the interior is not known to us. When and by whom were they made? The people now inhabiting the island know nothing of their origin or purpose, and take no interest in them: they have no tradition even of the extinct people by whom they were raised. Transported from other lands, as things now are, they could not have been. Is there any other mode of explaining their existence than by the belief that Polynesia was once a continent,—a submerged continent and an extinct people;—that we have here another,—

> "Lyonnesse—
> A land of old upheaven from the abyss
> By fire, to sink into the abyss again;
> Where fragments of forgotten peoples dwelt."
> TENNYSON.

A submergence of vast tracts of lands similar to that suggested with reference to Easter Island probably took place in the Atlantic. Scholars will remember the tradition in Plato's dialogue, entitled "Timœus," making direct mention of a great Island of Atlantis, situated beyond the pillars of Hercules. On this extensive Atlantic island there was a powerful kingdom. In an evil day, he writes, this island sank into the ocean. Professor Unger, of Vienna, in a valuable lecture on this sunken island of Atlantis, of which a translation is published in the *Journal of Botany*,‡ gives very interesting evidence in favour of this tradition from the flora and fauna, and in support of the theory that, "in the Tertiary period, or when lignite was formed, Europe must have been connected with North America, and the Atlantic ocean must have been divided at one place or another by a continent." The continental connexion of Australia and Europe during the Eocene period is argued for.

No metal nor even flint is found on Easter Island, but only some hard stones, capable of being fashioned into so-called celts. Were these figures produced with such instruments? The workmanship is rude, but not bad. Some description of those in the British Museum, and now illustrated by us, we have already given, and need not repeat it. Observe the excellent conventional treatment of the arm and hand, and of the jaw and chest in the larger figure. The ears (if they are ears) are very peculiar. The carving on the back of the smaller figure, tufa, is very remarkable; the band in the larger figure is clasped in the two hands. The receding forehead and projecting mouth are very striking. The tufa crowns are also singular, and are in many cases 6 ft. high, and 5 ft. in diameter. These must have been placed on the top of the statues after their erection,—not an easy task.

An esteemed correspondent, an artist, who went to the museum to see these figures, in consequence of the papers in our pages, is disappointed with their rudeness. He writes,—"As these frightful idols stand in juxta-position, under the portico of the Museum, with by no means the finest specimens of Grecian art, the contrast is something remarkable, and to be noted; for we may at once see that it is needless to lament the absence of any other records of the people who produced them, for 'Barbarian fecit,' is clearly and unmistakably incised in characters easily to be deciphered by the educated, artistic eye. There is no kind of information which a man would not rather have than not, if it could be obtained by the mere wish; but as there is nothing to be told about these frightful stones except that 'there they are!' and from intrinsic evidence that 'they were hewn by savages,' we may be content. For if the *submergence theory* be correct, as doubtless it is, we may regard the drowning of that continent, and the preservation of these monstrosities as wise decrees of Providence; showing in the one case that that continent was an unfruitful field, and by the remains that the submergence was just."

Our correspondent takes for granted the very point that is in question, a point of the deepest interest, and to the settlement of which the presence of these statues brings strong evidence. Even from the art point of view they may prove important links in art history.

It does not seem certain that we may claim for these figures a very high antiquity: they are very Mexican in appearance, and their age may be not greater than that of the ruined cities of Central America, of which we know. The submergence might have taken place in the Middle Ages, without any intimation of the momentous occurrence reaching us. They may, however, be very much older. Anyhow they represent a most extraordinary phenomenon, and present very curious questions for consideration. We can recall nothing more remarkable than the view we now give of part of the island, with its growth of statues.

* See pp. 930, 982, vol. xxvii.
† See p. 10.
‡ Vol. iii., p. 13, &c.

INSTITUTE OF PAINTERS IN WATER-COLOURS—WINTER EXHIBITION.

AT this season, when geniality and courtesy are expected to prevail, it would be churlish indeed to be ill-naturedly critical in regard of any means offered for intellectual amusement; and besides, drawings, sketches, and studies abound to such an extent just now, and such a wide average of merit obtains amongst them, that there is little room for anything but in praise to be said of them: so the best notice is one of where more are to be seen, and to invite inspection. It would be difficult to say anything new of some of the very best of them, and quite unnecessary to call attention to shortcoming where no attempt has existed at perfect performance, in the worst of them.

As the bells ring the changes, time being money, let us hope, as a harmless swindle, that we have passed the bad for the good; and for the good of everybody this happy new year; and if the prosperity of art is any real index to a general state of things, that picture exhibitions —winter and summer — may increase and multiply until they become too numerous to admit of particular notice: a kind wish to more than the painters.

The "supplementary" exhibition (we thank thee, June, for teaching us that word) at the Institute of Painters in Water Colours is sure to be an attractive one; for, to clever, striking examples of Messrs. Absolon's, Corbould's, Warren's, and the better known of the members' skill, there are some choice and very finished performances contributed by the younger of the figure draughtsmen, in addition to a capital display of landscapes, to give it more than ordinary interest. Mr. Andrew C. Gow's drawings are especially noticeable for the precise and elaborate finish which he manages to attain without sacrifice of breadth in effect or purity of colour, and with very truthful imitation of light. "An Armourer" (66) and "Hamilton of Bothwellhaugh" (83) are examples that prove the value of these qualities when invested in the mere positive representation of two well-costumed and appointed figures; but where motive or narrative may be concerned, Mr. Gow has shown himself the taming influence of making these technical excellences a chief consideration in his depiction of a belligerent Roundhead drawing on some Cavaliers (360), for there is a want of character and force in this,—

> "A controversy that affords
> Actions for arguments, not words."—*Hudibras.*

Mr. James D. Linton's studies are very exqui-

site, none more so than that of a lady designated "Maud" (324), which is but one of some eight or nine that betoken a rare combination of power and refinement. Mr. Valentine W. Bromley delights in picturesque allusions to the past. "The Terrace" (52); "A Lily" (387); "The Lady's Maid" (393), and "A Steel Mirror" (423), are dainty little pictures that apostrophise life 400 years ago at least, and speak of more enduring fashions than those that regulate our dress. How old the world is, and how young are some of its oldest customs.

Mr. Chas. Cattermole, in his several small compositions, exhibits a similar fancy for indicating the long wear of human habits; and this fancy helps him to paint in very bright colours very ordinary incidents: he is always seen to the best advantage on the scale of such works as "My Lady's Pensioners" (416), or, again, in "The Chapel" (425), where the sins that may not be covered by charity are being confessed. "May Day" with my lord and my lady, and the clown, who, in connexion with Jack-in-the-Green, was never known to do anything else ›ı y "Hollo! boys" (53), is a record of an obsolete institution, that shares some of the interest attached to fifteenth or sixteenth century incidents; but it is in artfully, if not artificially, disposed heroines of the present era that Mr. C. Green's clear, dexterous manipulation tells to the best effect. "The Sketcher" (403) and another charming young lady, who appears to be making a very elaborate study of something or somebody, "In the Wood" (412), are two of the choice items in the collection. "Juliet's Nurse" (75); and "A Royalist" (349), are two very clever studies, by Mr. H. B. Roberts; and with Mr. R. Beavis's Borderers on "The March —Stormy Weather," driving the cattle before them secured in their last raid (31); Mr. Guido Bach's "Bohemian Mendicants" (97), and various other studies, including more of Bohemians, very easily and largely done, Mr. A. Bouvier's "Wallachian Girl" (101), and Mr. E. H. Corbould's autographic ink sketch illustrating a black-letter edition of a nursery rhyme, that speaks of the dogs that barked in their antipathy to beggars (123), are of those things that, when found, will be made a note of.

Mr. H. Tidey's two children, "Daisy" (213) and "Dolly" (233), will meet with more admirers by reason of their agreeable naturalness than would many a more pretentious work, with less claim to be considered truthful.

What bright, fresh-looking little children Miss Emily Farmer selects for her study: the little dot who is drawing tones from a concertina, and making "Music" (90) visible, and she who is "Saying Grace" (364) before a feast-of-reason dinner, are music and reason most gracefully and cleverly portrayed,—types of such mundane enjoyment as Mr. G. G. Kilburne's "Puritan Preacher" (19), in a dry hard manner would be most likely to deprecate; but Miss Farmer's reflections are more pleasurable than the solid, stolid representation of the preacher, excellent as it is in its way.

But the landscapes, studies on shore and of sea,—buildings, exteriors and interiors, call for an equal share of attention. It must be delightful, indeed, to such an adept in the art of transcription as Mr. Wm. Bennett, to fix Nature, as it were, in his questions of her; to learn her answers, and to put them down in such a quick handwriting,—short-hand, perhaps, but everybody can read it. Who can talk so lightly of old corrugated trunks, fresh young leaves, and the dewy grass that grows on the earth,—the grave of the young and aged alike,—without thinking more than he says? No one can speak more in a few words than Mr. Bennett, or, in a rough way, more feelingly. "Sketch of Royal Oaks, Windsor Forest—Autumn" (79). Mr. Edmund Warren honestly announces his more direct communing; he relates the "Whispers of Winter" (100) in a beechen grove, with falling leaves to punctuate the minutes of his meeting: rather a dark picture, but an honest one,—for, Time will come, and Time will go, and we can't go on for ever.

Messrs. H. G. Hine, J. G. Philp, J. Mogford, H. Maplestone, J. W. Whymper, W. L. Leitch, J. C. Reed, and Messrs. Pidgeon, S. Prout, Rowbotham, Telbin, Hargitt, Harry Johnson, Mitchell, A. Penley, Richardson, and Wood, are all admirably repres nted; and Mr. Carl Werner and Mr. C. Vacher retain their riches as wise men of the East,—and clever men anywhere.

Mr. James Fahey, amongst some eight or ten examples, exhibits a very masterly drawing, "Blackgang Chine, Isle of Wight" (281); Mr. Shalders is as clever as ever in his studies of sheep; and Mr. D. H. M'Kewan quite monopolises a right here of painting "gallery pictures;" a right that is not to be waived any more than Mr. Edwin Hayes's as a wave-painter; see—sea in many instances. Mr. Mole is as indicative of peace and rural felicity as ever: industry and content are the lessons he teaches, and they are good ones,—nicely and quietly taught, but, apparently, never conclusive.

Messrs. W. W. Deane & J. H. D'Egville paint Venice in her own colours, seen with artists' eyes; and their drawings very much add to the value of the collection.

CO-OPERATIVE STORES, EDENFIELD, BURY.

THE new hall in connexion with Edenfield Co-operative Society has been opened.

Early last year, the committee having decided to build new stores and six houses, a plot of land was secured for the purpose near the toll-bar, on the Bury-road. Plans were procured from Messrs. Maxwell & Tuke, and the building was begun in May, the work being let separately to local tradesmen for the sum of 2,463*l.*, exclusive of heating apparatus and fittings, and this sum has only been exceeded by about 10*l.*, which must be a source of gratification to the committee. The total cost, including fittings, is 2,800*l.*, which sum, however, does not include the cost of land. The design of the building is extremely simple. The fronts are of pitch-faced parpoints, with Holcombe stone dressings. Towards the front are three shops; the grocer's 22 ft. by 31 ft., at the end of which are shoots and bins for flour, &c., which are tipped from the warehouse behind upon a higher level. The draper's shop is 26 ft. by 24 ft.; the butcher's, 18 ft. by 16 ft.; and the clogger's shop, which is in the side street, is 20 ft. by 12 ft. There are also in this street the cart-entrance to the warehouse, a room 43 ft. by 21 ft., and the entrance to the assembly-room on the first floor, which is a room 65 ft. by 31 ft., with plain hopper ceiling and plaster moulds. Attached are secretary's room, board-room, ante-rooms, tea-room, &c., the whole being heated upon the super-heated principle as applied by Mr. Longbottom, of Pleasington.

ON EARTHQUAKES.

EARTHQUAKES are movements of the superficial crust of the earth, consisting for the most part of one or more rapidly succeeding undulations, accompanied often by sounds, and traceable distinctly in some particular direction, chiefly linear, taking time to proceed from one point to another. The shocks of earthquakes are of three kinds:—

1. The *undulatory* motion, which takes place horizontally, heaving the ground upwards and downwards.

2. The *successive* motion, in which the ground is heaved up in a direction more or less approaching to the perpendicular.

3. The *vorticose*, or twisting motion, which is a combination of the two preceding ones, several undulations taking place contemporaneously, and this interfering with the other, producing a complexity of rotatory movement, like the surface of the sea. Of these three kinds the first are the most common and the most harmless. From the second more is to be apprehended; but the *vorticose* movement is the one which has been felt in the most violent and disastrous catastrophes on record. (Daubeny on "Volcanoes," p. 509.)

Generally after the shock of the earthquake the great ocean wave reaches the shore, and completes the destruction. The sound of the explosion is conveyed through the earth at the rate of from 7,000 ft. to 10,000 ft. in a second in hard rock. When an earthquake begins under the ocean it occasions five distinct series of waves or undulations. But sounds sometimes occur when there is no earthquake. The oceanic wave raised at Lisbon travelled to Barbadoes at the rate of seven to eight miles, and to Portsmouth at the rate of little more than two miles, in a minute. The velocity of the shock varies with the elasticity of the strata it passes through. In the great earthquake in Calabria in 1783, most damage was done at the junction of the deep alluvial plains with the hard strata of the mountains. The earthquake that happened in 1842 in Guadaloupe was felt over an extent of 3,000 miles. A shock is sometimes perceived in a mine that is not felt at the surface, though in some instances miners have not been sensible of the shocks felt on the surface above. The raising and depressing of land almost imperceptibly is always going on. The coast of Denmark on the Sound, the island of Saltholm, opposite to Copenhagen, and that of Bornholm, are rising; the latter at the rate of 1 ft. in a century. The coast of Memel, on the Baltic, has actually risen 1 ft. 4 in. within the last thirty years, while the coast of Pillau has sunk down 1½ in. in the same period.

The most extensive district of earthquakes comprises the Mediterranean and the adjacent countries, Asia Minor, the Caspian Sea, Caucasus, and the Persian mountains. The chief focus of the vast volcanic district in central Asia appears to be Thian-Shan, including Lake Baikal. Africa is almost entirely free from them, and they are extremely rare in the great eastern plains of South America. 318 earthquakes are recorded to have occurred in the valley of the Danube since the commencement of the fourth century.

The smallest number of earthquakes occur in Russia, and in the Ural Mountains they are almost unknown. The whole chain of the Andes, especially the Cordilleras, are exposed to every kind of subterranean disturbance felt along a line of 1,000 miles.

In argillaceous strata, it frequently happens that the fissures caused by earthquakes close up again; but in more solid rocks they remain open for ages.

Mr. Mallet gives us the following order of the phenomena of an earthquake:—"First we have the earth sound-wave, and the great earth-wave or shock; the sound wave through the air; the sea-wave occurring at the time, called the forced sea-wave, and the great sea-wave, all originating at the same moment, and produced by one impulse. The sound-wave through the earth, and the great earth-wave, or shock, arrive first, and are heard and felt on land, accompanied, as far as the beach, by the small sea-wave called the forced sea-wave; these are almost instantly succeeded by the sound-wave through the sea; next arrive the aërial waves of sound, and these continue to be heard for a longer or a shorter time; and finally, the great sea-wave rolls in upon the shore. The velocity of the land-wave, and that of the accompanying sea-wave being ascertained, it would seem possible to determine the distance (out at sea) from the spot affected at which the earthquake originated. But the former will vary with the nature of the rock through which it is transmitted; for the harder and more elastic the rock is, the greater will be the velocity of the earth-wave produced, and *vice versâ*." The velocity of the earth-wave through limestone is about 40 miles per minute; sandstone, 57 miles per minute; marble, 73 miles per minute; or through clay slate, 140 miles per minute.

In the "Histoire des Progrès de la Géologie" (vol. i.) some statistics are given regarding 3,432 distinct earthquakes that have occurred in Europe and the adjacent parts of Asia and Africa, between the commencement of the fourth century and the year 1844 inclusive. Of these the dates of nearly 3,000 are known, and they have been found to be thus distributed in the different months of the year:—

December	300	911 in winter.
January	366	
February	275	
March	265	710 in spring.
April	235	
May	210	
June	210	653 in summer.
July	216	
August	236	
September	221	705 in autumn.
October	252	
November	232	

There have thus been 1,712 recorded eruptions between the 1st of October and the 31st of March, and only 1,335 from the 1st of April to September 30th. This general result is remarkable as being in conformity with the more detailed observations, and also because it appears that in each particular year the same order was observed; but it must not be regarded as important with respect to the general phenomena of earthquakes in other districts where other results may be obtained. In Upper and Western India, between 1800 and 1842, 162 earthquakes are recorded.

Mrs. Somerville (Physical Geog., p. 161) states that 255 slight shocks have occurred in Great Britain, of which 139 took place in Scotland; the most violent of these have been felt at Comrie, in Perthshire, in 1839. Of the rest, 14 took place on the borders of Yorkshire and

Devon, 30 in Wales, and 31 on the south coast of England. They were all preceded by a sudden fall of the barometer, and unusual sultriness. Those who have felt an earthquake describe a feeling of dread or horror produced upon them. The lower animals especially feel this. Humboldt says the noise often heard is "rolling, rattling, clanking like chains, occasionally like thunder close at hand: or it is clear and ringing, as if masses of obsidian or other vitrified matters were struck in caverns underground." Noises have been heard at 700 miles' distance from the place where the earthquake took place. An earthquake has damaged the Great Pyramid of Egypt, though that country has been very free of these convulsions for a long time. Sir Charles Lyell says "the energy of subterranean movements has always been uniform as regards the *whole* earth,"—a comforting assurance.

The first earthquake on record occurred B.C. 1491, when the law was delivered to Moses on Mount Sinai (Exodus xix. 18). Forty-one years after that one took place in Central Italy, which swallowed up a city and produced Lake Ciminus in its place. China was visited by an earthquake B.C. 595. In 425, a very severe one occurred in Greece. B.C. 224, the Colossus at Rhodes, one of the "Seven Wonders of the World," was overthrown by an earthquake. B.C. 33, more than 30,000 people perished from this cause in Palestine. Antioch was destroyed A.D. 115, and in the same year an earthquake was felt in China. In 262 an earthquake devastated Rome, Libya, and Asia Minor, attended by an eclipse. About 555, an earthquake was felt at Constantinople, and in the same place two years afterwards. In 684, more than 500,000 acres of land in the Japanese island Sikokf were swallowed up by the sea. In 859 another earthquake occurred at Antioch, when 1,500 houses were destroyed. Wendover tells us that in 974 a great earthquake shook all England. A correspondent of the *Spectator* says that in 1081 one occurred in this country which was attended "with heavy bellowing." In 1089, there was "a mickle earth-stirring all over England," according to the *Chronicle*. Florence, of Worcester, says that in 1110 "there was a very great earthquake at Shrewsbury. The river Trent was dried up at Nottingham from morning to the third hour of the day, so that men walked dry shod through its channels." Matthew Paris says that in 1165, "there was an earthquake in Ely, Norfolk, and Suffolk, so that it threw down men who were standing and rang the church bells." He speaks of others in 1187 and 1247. In the latter, the sea became preternaturally calm for three months. In 1248 another was felt in the West of England. Holinshed says that in 1185 "a sore earthquake chanced through all the parts of this land, such a one as the like had not been heard of in England since the beginning of the world; for stones that lay couched fast in the earth were removed out of their places, houses were overthrown, and the great church of Lincoln rent from the top downwards." In 1247 one occurred on St. Valentine's Eve, and did considerable damage in London. It is stated that three months prior to the shock the sea ceased to ebb and flow on the English coast. On September 12, 1275, Glastonbury Church was destroyed in this manner, and in 1361 John Harding records in his metrical chronicle:—

> "On St. Mary's Day,
> The great wind and earthquake marvellous,
> That greatly gave the people all affraye,
> So dreadful was it and perilous."

In 1381 Fabyan says an earthquake occurred, "the like thereof was never seen in England before that day nor since." And the next year Harding writes:—

> "The earthquake was, that time I saw
> That castles, walls, towers, and steeples fyll,
> Houses and trees, and crags from the hill."

This happened on the 21st of May, and was followed three days after by a "watershake," by which the ships in the harbours were driven against each other with great violence. ("Book of Days," i., 232.)

In 1456 a terrible earthquake devastated the country round Naples, many towns were injured, and 60,000 lives lost.

On May 21, 1382, Stowe says "there was a great earthquake in England at nine of the clocke, fearing the hearts of many; but in Kent it was most vehement, where it sunk some churches and threw them down to the earth." A song written at the time is contained in "Political Poems and Songs relating to English History," i., 1859. The spelling is modernised:—

> "And also when this earth-quake,
> Was none so proud he was aghast,
> And all his jollity forsook,
> And thought on God while that it last;
> And as soon as it was over-past,
> Then wax as evil as they dead are;
> Each man in his heart may cast,
> This was a warning to beware.
>
> Forsooth, this was a Lord to dread,
> So suddenly made men aghast,
> Of gold and silver the took nane heed,
> But out of their houses full soon they passed;
> Chambers, chimneys, all to burst,
> Churches and castles foul 'gan fare;
> Pinnacles, steeples, to ground it cast,
> And all for warning to beware."

In 1531 Spain was visited, and Lisbon suffered much. In that city 1,500 houses were thrown down and many buildings destroyed. Of the great earthquake 200 years later we shall speak hereafter.

Burton, in his "History of Earthquakes," tells us that in 1571, on the evening of February 17, the earth near Kinaston, Herefordshire, began to open, and a hill called Marclay Hill, with a rock under it, made at first a mighty bellowing noise, off, and then lifting itself up began to travel, carrying along with it the trees that grew upon it, the sheepfolds and flocks of sheep abiding thereon at the same time. In the place from whence it removed it left a gaping distance 40 ft. wide, and 80 ells long. The whole field was nearly 20 acres. Passing along it overthrew a chapel, and removed a yew-tree which was growing in the churchyard from the west to the east. Another earthquake was felt in Yorkshire, Worcestershire, and several of the adjacent counties in May in the same year.

In 1580 (April 6th) a severe earthquake was felt in London. People rushed out of the theatres, part of the Temple Church was thrown down, and two apprentices were killed at Christ Church by a fall of a stone during the service. Much damage was done in Kent by this earthquake. Queen Elizabeth caused a form of prayer to be used by all householders. In 1638 (March 28th), 180 towns and villages of Calabria and Sicily were reduced to ruins. In 1680, Lyme Regis suffered by an earthquake. An earthquake was severely felt in London and other places September 8th, 1692. Evelyn says, "At Mins it has made some demolition. I happened to be at my brother's house at Wotton (Surrey), when the shaking was, and at dinner with much company, yet none of us at table were sensible of any motion. But the maid who was making my bed, and another servant in a garret above her, felt it plainly, and so did my wife's laundry-maid here at Deptford. In London, and particularly in Dover-street, they were greatly affrighted." In the next year the great Sicilian earthquake destroyed 100,000 persons. In 1747 a great earthquake destroyed Callao, and there is an absurd statement that only one of the inhabitants was saved; but Sir Charles Lyell has shown that 200 escaped.

On the 8th of February, 1750, an earthquake was felt in London. Several chimneys were thrown down, and walls rent. A shepherd at Kensington heard the noise rush past him, and instantly saw the ground wave under him like the face of the river; the tall trees of the avenue where he was nodded their tops very sensibly, and quivered. (Philos. Trans., xlvi.) Walcott, in his "Westminster," says that during this earthquake, felt between twelve and one o'clock, the Thames was greatly agitated, and the barristers were greatly alarmed, for they thought that Westminster Hall was coming down. Another earthquake was felt March 8th in the same year. The houses near the Thames were most shaken. It is stated (Philos. Trans., xlvi.) that near London there was a continued and confused lightning till within a minute or two of the shock; dogs howled, fish jumped 3 ft. out of the water, a ball of fire was also seen. Martin Folkes, P.R.S., stated that he did not on this occasion perceive that lifting motion which he was sensible of on February 8th, but he felt very quick shakes or tremours horizontally. A boatman on the Thames felt his boat receive a blow at the bottom, and the whole river seemed agitated. In the Temple Gardens, the noise was greater than the loudest report of cannon. It resembled distant thunder in the air, but was not a subterranean explosion. A vast ball of fire was observed, and frequent flashes of lightning. The shock lasted a minute. Walcott says great stones were thrown from "the new spire" of Westminster Abbey, and in several steeples the bells were struck by chime-hammers. Horace Walpole, writing to Sir Horace Mann, says, "I had been awake, and had scarce dozed again when on a sudden I felt my bolster lift up my head; I thought somebody was getting under my bed, but soon found it was a strong earthquake, that lasted near half a minute, with a violent vibration and great roaring. I rang my bell, my servant came up frightened out of his senses; in an instant we heard all the windows in the neighbourhood flung up. I got up, and found people running into the streets, but saw no mischief done; there had been some,—two old houses flung down, several chimneys, and much china ware. Admiral Knowles, who had lived a long time in Jamaica, and felt seven there, says this was more violent than any of them. It has nowhere reached above ten miles from London. A parson, who came into White's the morning of earthquake the first, and heard bets laid as to whether it was an earthquake or the blowing up of powder-mills, went away exceedingly scandalised, and said, 'I protest they are such an impious set of people that I believe if the last trumpet were to sound they would bet puppet-show against Judgment.'"

Another was felt on the 18th of March, in the same year, at Portsmouth, Southampton, and the Isle of Wight. In the next month Cheshire, Flintshire, and Yorkshire were startled in a like manner, and in May one was felt in Dorsetshire, and another in Somersetshire in July, Lincolnshire in August, and yet another on September 30th in Suffolk, Leicester, and Northampton.

The great earthquake of Lisbon happened on November 1st, 1755. A work published in 1757 gives the following account of this terrible disaster:—

"The year 1755 proved very wet and rainy, the summer cooler than usual, and for forty days before the great earthquake clear weather, yet not remarkably so. The 31st of October the atmosphere and light of the sun had the appearance of clouds, with a notable obfuscation. The 1st of November, early in the morning, a thick fog arose, which was soon dissipated by the heat of the sun, no wind stirring, the sea calm, and the weather as warm as in England in June or July. At thirty-five minutes after nine o'clock, without the least warning, except a rumbling noise, not unlike the artificial thunder at our theatres, a most dreadful earthquake shook, by short but quick vibration, the foundation of all Lisbon, so that many of the tallest edifices fell that instant."

We may remark that the people were in the churches, for it was the festival of All Saints, and a multitude perished when the great church of St. Paul fell. The account continues, "Then, with a scarcely perceptible pause, the nature of the motion changed, and every building was tossed like a wagon driven violently over rough stones, which laid in ruins almost every house, church, convent, and public building, with an incredible slaughter of the people. It continued in all about six minutes. At the moment of the beginning some persons on the river, near a mile from the city, heard their boat make a noise as if run aground or landing, though in deep water, and saw at the same time the houses falling on both sides the river. The large new quay, called Cays Depreda, was overturned, with many hundreds of people on it, and sunk to an unfathomable depth in the water, not so much as one body afterwards appearing. The bar was seen dry from shore to shore; then suddenly the sea, like a mountain, came rolling in, and about Belem Castle the water rose 50 ft. almost in an instant, and had it not been for the great bay opposite to the city, which received and spread the great flux, the low part of it must have been under water. As it was, it came up to the houses, and drove the inhabitants to the hills. About noon, there was another shock, when the walls of several houses which were still standing were seen to open from top to bottom more than a quarter of a yard, but closed again so exactly as to leave scarce any mark of the injury. 60,000 people were buried, crushed, or drowned. At Colares, a distance of about twenty miles from Lisbon, three distinct shocks were felt, accompanied by the emission of a quantity of smoke, and the fountains were affected. At Coimbra, several buildings were destroyed, and at Oporto the shocks were felt for six or seven minutes, during which everything shook and rattled. At or near Cadiz, the destruction was great, and a terrific wave came 60 ft. in height. It was felt at Gibraltar and Madrid; at the latter place, the indications were very decided. At Seville, the cathedral was damaged. The seaport of Setubal, twenty miles from Lisbon, was engulfed, and disappeared altogether. Near Morocco the earth

opened and swallowed up a town with 8,000 inhabitants. This earthquake was felt in France, near Angoulême. A subterranean noise was heard, after which the earth opened and discharged a torrent of water, mixed with red sand. In Italy, shocks were felt at Turin and Milan; and the waters of the Mediterranean were greatly disturbed. Agitations were noticed on the lakes of Geneva and Zurich, in Switzerland. Movements were felt in Germany, Holland, Norway, and Bohemia; also in the British Islands, particularly in Derbyshire and Berkshire, and movements of the water were observed along the coast. Mr. Mallet states that it was also felt at Loch Lomond, in Scotland:—'The water, without any apparent cause, rose against the banks of the Loch, and then subsided below its usual level: the greatest height of the swell being 2 ft. 4 in.' The time of the shocks in England was from 9 30 to 11. Parts of Africa were affected, especially on the Mediterranean coast. These various places we have mentioned are so far distant that the effects of the earthquake of November 1, 1755, were distributed over very nearly 4,000,000 of English square miles of the earth's surface." (Hist. and Philos. of Earthquakes, p. 333.)

On February 8, 1761, a shock was felt along the banks of the Thames, from Greenwich to Richmond. Chimneys were thrown down at Limehouse and Poplar. It was felt also at Hampstead and Highgate. Another shock, more violent, took place on the same day between five and six, the air being very warm, and strong lightning flashed for some time before. Persons fled to the streets, thinking their houses were coming down. In St. James's Park and other open spaces at the West-end the tremulous vibration was most distinct, and seemed to move in a south and north direction.

On June 7, 1773, the city of Santiago, in Guatemala was destroyed; 6,000 families perished. On February 5, 1783, the Calabrian earthquake took place. The ground for miles appeared like the sea. Immense ravines were formed: one measured a mile in length, 105 ft. in breadth, and 30 ft. in depth. Another was three-quarters of a mile long, 150 ft. broad, and more than 100 ft. deep. (Lyell's "Principles," p. 459.) In this earthquake 40,000 persons perished. Dolomien, who saw the city of Polistena, in Calabria, after the earthquake, says:—"The scene of horror almost deprived me of my faculties; my mind was filled with mingled horror and compassion. Nothing had escaped; all was levelled with the dust; not a single house or piece of wall remained; on all sides were heaps of stone so destitute of form that they afforded no idea of there ever having been a town on this spot." The Prince of Scilla and 1,430 of his servants perished.

In 1805 (July 26th), another severe earthquake devastated Calabria,—20,000 persons perished. In 1816, on the evening of the 13th of August, a shock was felt over nearly the whole of the north of Scotland. The shock lasted only six seconds, and travelled from S.S.E. to N.N.W. Heavy articles of furniture were removed, bells set ringing, &c. At Inverness the walls of many houses were rent from top to bottom.

In July, 1843, shocks were felt on the Cornish coast; and on the 22nd of December, in the same year, considerable shocks occurred in Brittany. In January, 1845, an earthquake was felt at Arendal, in Norway.

Three years before, a report was circulated that London would be destroyed by an earthquake on St. Patrick's Day (March 17th). It was founded on certain doggerel prophecies pretended to be pronounced in the year 1203, and preserved in the Harleian Collection. Numbers of persons left the metropolis. But, upon reference to the British Museum, the so-called prophecies were not to be found, and it was evidently an attempt to impose upon public credulity.

Several earthquakes occurred in 1851. One of these, on August 14th, destroyed the towns of Melfi and Barile, in South Italy, with 1,000 people.

On November 9th, 1852, slight shocks were felt in the north-western counties.

In 1857 (December 16th), Calabria was again visited by a most destructive earthquake, and 10,000 persons perished.

On October 6, 1863, a shock was slightly felt in London, but more in the centre and western parts of England.

On the 18th of November, 1867, the island of St. Thomas, which, twenty days previously, was the scene of a terrific hurricane, was visited by an earthquake. In this case also a great wave, 40 ft. or 50 ft. high, came towards the harbour at the rate of fifty miles an hour. It was, however, happily broken by the rocky headlands, and did not go inland more than 100 yards above the usual high-water mark. The disaster extended to other adjacent islands.

The coast of Peru on the 13th of August, 1868, was visited by a terrible earthquake, accompanied by a wave which destroyed a vast quantity of property and many lives. At Caldera no shock was felt,—the town stands some height above the sea,—but at Copiapo, about fifty miles distant, some houses were seriously shaken. At Iquique, a few minutes past five in the afternoon, there was a low rumbling sound. The natives knew what was coming, and fled from the houses, and very few lives were lost by the earthquake; but the sea receded with great rapidity for a considerable distance, and met a vast wave 40 ft. high rolling steadily on at the rate of about fourteen miles an hour. It surged over the town and neighbouring beach; everything in the lower parts of the town was swept away. Most of the people had fled to the higher parts of the town, and so escaped, but more than 150 were swept off. The loss of property is estimated at 500,000*l*. Twenty miles north is the port of Mexillones. Here the sea receded, and came back in the same manner, and thirty people were drowned, and a great deal of property was destroyed.

At Arica (population 4,000), a town containing some of the handsomest and most substantial of any buildings in Peru, the sea had a dull appearance, and the gulls were said to quit the bay with loud screams. At 4.45 p.m., the first shock of the earthquake was felt. Mr. Nugent, the vice-consul, says:—

"When I felt the first shock, I went to the room where Mrs. Nugent was to tell her not to be alarmed, but as I got there, a second one came, so violent, that I carried off the children, and we all rushed out of the house. Scarcely had we reached the street, when it all came down, everything around us was tumbling down, and my wife said, 'Let us go and stand on the ruins of our house,—nothing can touch us there.' I had, however, long made up my mind that if ever we had a severe earthquake, the sea would come in, and I said, 'Let us make for the high ground.' We passed up the centre of the street; everything in ruins, numbers of dead, and the wounded lying under the walls, shrieking for assistance. Blinded with dust, and scarcely able to breathe from the sulphur in the air, we stopped at the first rising ground. The whole town, with the exception of a few of the second-storied houses, was shaken down. They stood high above the ruins. The quay and mole were crowded with people, who appeared to be panic-struck, for the sea had gone out from the bay, and there was a great wave coming in; presently they took flight, but at least 200 of them were swept away. Wave succeeded wave, at intervals of about a quarter of an hour, and long before dark there was not a vestige of the lower part of the town remaining. During all the night the shocks of earthquake continued, and the noise was like distant cannonading. The water in the few wells that could be got at was so hot (sulphuric), that it was quite undrinkable. So we passed the night on the hills."

The waves carried off the engines on the railway, and destroyed the Custom-house and its contents. The six vessels at anchor in the bay were all lost. Besides these, the *Wateree*, United States gunboat, battened down, and took every precaution that seamanship could suggest against the approaching danger. But she was whirled about by each wave, till one larger than the other carried her off and left her among the sand-hills far from the beach. She was landed perfectly upright without a scratch, and not a man was lost. The American Admiral determined to offer her for sale, as the expense of getting her 400 yards over the country, and launching her, would be very great.

Many slight shocks have since been felt along on the coast of Peru. The effects of this earthquake have been felt along the whole coast, from 8 deg. to 42 deg. south latitude. Juan Fernandez was visited by the great wave. We are indebted for these facts to the report communicated to the Board of Admiralty. A despatch from her Majesty's Chargé d'Affaires at Lima states that the earth continued in movement for a whole month, to the 13th of September. People hoped that there would be no more shocks, and they were warranted in this hope by former experience; for, according to the chronicles of the unfortunate city which has now been in ruins three times, formerly by the "terremeto" of St. Ursula, in the seventeenth century, and then in the year 1784 the earth kept in motion for thirty days. The rebuilding of Arequipa will probably be the work of a century, and the cost 40,000,000 dollars; the loss of 6,000 houses and 200 farms and factories may be computed at a higher sum. The despatch goes on to state that, contrary to expectation, several shocks had been felt since the 13th of September. 7,000 or 8,000 people left Arequipa for the interior. At Arica the French hotel was displaced bodily by the waves, and ultimately left on the ruins of another house.

Mr. E. G. Squier (an archæologist) says there is nothing incredible in the story told by General Kilpatrick, United States Minister to Peru, that during the recent earthquake at Arica, 500 mummies were thrown on the surface. He says:—"The desert hills behind Arica, as indeed those surrounding the few habitable spots on the Peruvian coast, are literally stuffed with the desiccated bodies of the aborigines. They are but thinly covered with the light and nitrous sands, and are often exposed by the winds. I have seen dozens of them at Arica, lying on the surface, wrapped in coarse grass matting, or in their crumbling nets, for most who lived here seem to have been fishermen. I have carefully examined hundreds of the so-called mummies without finding the slightest evidence that their preservation is due to other than natural conditions of soil and climate."

On the 26th of March, 1868, a slight earthquake was felt in various parts of Wales, and on October 30th, at 10 40 p.m., a distinct shock was felt in the West of England and in South Wales. Some of the correspondents of the *Times* describe it as a trembling of the earth as if a laden wagon was passing along the street. Up to the time of the shock the weather was cold, but the thermometer rose 15 degrees on the Saturday. Three shocks were felt in Leamington. Dr. O'Callaghan noticed them, and he had, on more than one occasion, felt the shocks of earthquakes in the West Indies. Dr. Burder, of Clifton, said:—"My own impression was that of a heavy blow from beneath, the impulse of which was communicated upwards, through the chair on which I sat. I was not conscious of any lateral movement, nor of anything that could be called vibration." Mr. Parminter, of Swansea, said his "experience of it was a trembling of the house, with a rumbling noise for about five seconds, and then a very perceptible swaying to and fro of the room myself and family were sitting in." Mr. Ward-Jackson, of Great Malvern, said "it began with the usual rumbling and vibratory sort of sound, followed immediately by three distinct vibrations, proceeding as nearly as I could judge in a direction from N.W. to S.E., lasting about nine or ten seconds. The night was fine, calm, and mild."

Another gentleman stated that his "bed felt as if it were lifted up with a tremulous motion." The shock was felt at Liverpool and Manchester.

Another correspondent of the same paper said, "My chair for an instant shook violently, and I perceived what I might have taken for a furious blast of wind, but it was too instantaneous, and it seemed to come from the earth rather than from the air. The shock was not violent, nor did it seem to last so long, as that which affected a considerable area in the south of England early in the morning of October 6th, 1863. On that occasion, I was awakened from my sleep with the impression that a stack of chimneys on one side of my room had fallen down, and that I should see the wall opposite to my bed crack open."

In Leicester, the window frames rattled, and also various things in the houses, so violently as to disturb the inhabitants from their slumbers. At Blackheath, near London, a correspondent of the same paper states, "My daughters came down from their beds in the greatest alarm, and said they had had their beds shaken under them, and that they were convinced it was an earthquake. A servant in the house, who was also in bed, stated that she had felt the same shaking, and each of them from the sensation experienced a feeling of sickness."

Nor was this all. Another shock was felt at Holyhead at five minutes to four on Tuesday morning, November 3rd, 1868. *The Birmingham Post* stated that several persons living in the vicinity of Raglan-street, Coventry, said that on Tuesday night they felt the shock of an earthquake. Slight shocks have also been felt this year.

There is a very able paper in *Blackwood's Magazine*, July, 1869, on the electric theory of earthquakes and volcanoes. The writer explodes the absurd theory that at twenty miles below the surface the central heat is so great that the hardest granite is in a state of fusion, and that our planet consists of a molten mass nearly 8,000 miles in diameter, covered by a semi-molten crust only twenty miles in thickness, and of which crust only two miles have a temperature under the boiling point. The mean density of our planet is nearly five and a half times that of water, whereas the average density of the strata which we know is less than three times that of water, so that the central fire theory cannot be right. This latter theory is founded on the statement that in some mines and artesian wells the temperature gradually increases. But in one deep mine in Cornwall, at a certain point, the temperature begins to decline. Now, the theory advanced by the writer is this, that there is a zone of electric action in the crust of the earth corresponding with—but superior in intensity to—that which every one sees to exist in the surrounding gaseous envelope of the atmosphere. The electric currents ceaselessly passing to and fro in the subjacent rocks will necessarily develop heat, and in some kinds of rock, more than others. In metal mines the shaft is sunk through metalliferous strata, or through those kinds of rocks most permeated by electric currents. The increase of subterranean temperature is probably restricted to a narrow zone immediately underlying the surface, with a cold, dense stratum of rock underneath. Earthquakes may be, then, described as thunderstorms in the earth. When the electric action in the crust of the earth is developed to an excessive degree, and the conductive power of the rocks becomes inadequate to pass the currents with sufficient rapidity, an earthquake takes place. In severe shocks these vibrations swell into waves of commotion, extending long distances. The cyclones or rotatory storms in the atmosphere are due to electricity, and the earthquake which takes this form is always the most destructive, and clearly of electric origin. According to this theory, volcanoes are vents, which the subterranean electric action makes for itself, being eruptive; while earthquakes are vibratory. In the latter case, the subterranean explosive force cannot make its way to the surface, but produces terrible vibrations.

In the tropical regions, the zone of electric action is most active, and hence earthquakes and volcanoes occur there most frequently. We cannot go further into the facts given in the paper to support this opinion; but we think the theory that earthquakes and volcanoes are attributable to disturbances in the outer rim of the earth's crust occasioned by electric action analogous to those which have their seat in the atmosphere, is well worthy of attention. JOHN PIGGOTT, JUN.

KENSINGTON NEW PARISH CHURCH.

OF the ancient parish church of Kensington (written "Chenesiton" in Domesday-book, and "Chensnetuna" in other ancient records) nothing is known. Faulkner, in his "History and Antiquities of Kensington," says:—"This church was probably dedicated to St. Mary, and when it was annexed in the year 1111 to the Abbey of Abingdon, it received the additional epithet of Abbots, and is now called St. Mary Abbots' Kensington." The first vicar of Kensington, named in Newcourt's "Repertorium," is Roger de Besthorp vel Westhorp, A.D. 1260.

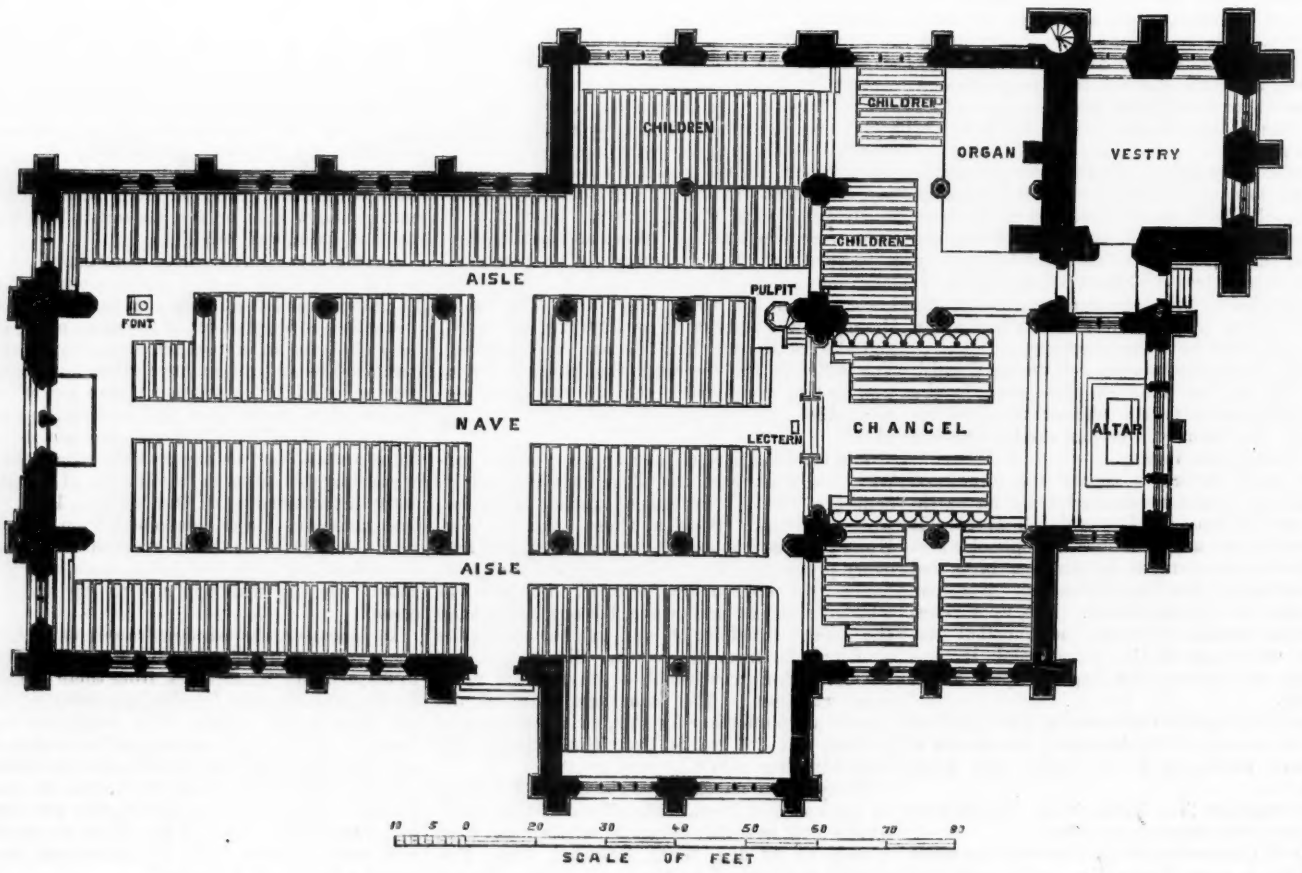
It appears that in 1683 the inhabitants, finding their church too small for the increasing population, built a new aisle on the south side; and then, in 1695, determined on pulling down the north aisle and chancel, and building others of larger dimensions. In 1696, however, a resolution was come to to pull down the whole church, with the exception of the Gothic tower. This was done, and a new structure erected, but with so little skill apparently, that, by the year 1704, the wall having cracked, and the timbers being found too weak, a large part of the church was taken down to the ground and rebuilt. In 1772 it was again thoroughly repaired, and the ancient tower was taken down, and the ugly brick affair the present generation has known was erected in its place. The parishioners seem to have been ill-served by those they employed, for in 1811 the building had fallen into a bad state, and they had to spend 5,000*l.* upon it to make it fit for the purpose. After that it was, of course, repaired and decorated on various occasions, and has now been taken down to make room for an entirely new church. It was an ugly, styleless brick building, with little in it to interest. Weever has preserved a few of the epitaphs that were in the older church, including one in memory of Richard and Elizabeth Schardeburgh, 1453, and another appertaining to Philip Meawtis, "oone of the secretaries to the Kings Henry VII. and Henry VIII.," who died in the year 1510.

The church recently taken down contained a number of inscribed tablets and other memorials. Some particulars of these were communicated to the *Gentleman's Magazine* by the conductor of this journal at the time his father was engaged in the restoration of the church for the parish, more years ago than he cares to specify. Doubtless a place will be found for many of the memorials in or about the new building. We may mention that in pulling down the old church a few fragments of moulded stonework, apparently of the date of the thirteenth and fifteenth centuries, were discovered built into the walls.

We give a view and plan of the new parish church now in progress, from the designs of Professor G. G. Scott. It is in the Geometrical style, will be built of stone, and accommodate, in the nave and aisles, transept and chancel aisles, 1,143 adults; in the choir, 86; and in various parts of the church, 377 children; making a total of 1,606.

The present contract for the erection of the new church includes only the chancel, chancel aisle, and first stage of tower, which will be carried out by Messrs. Dove Brothers, of Islington, for the sum of 8,375*l.*

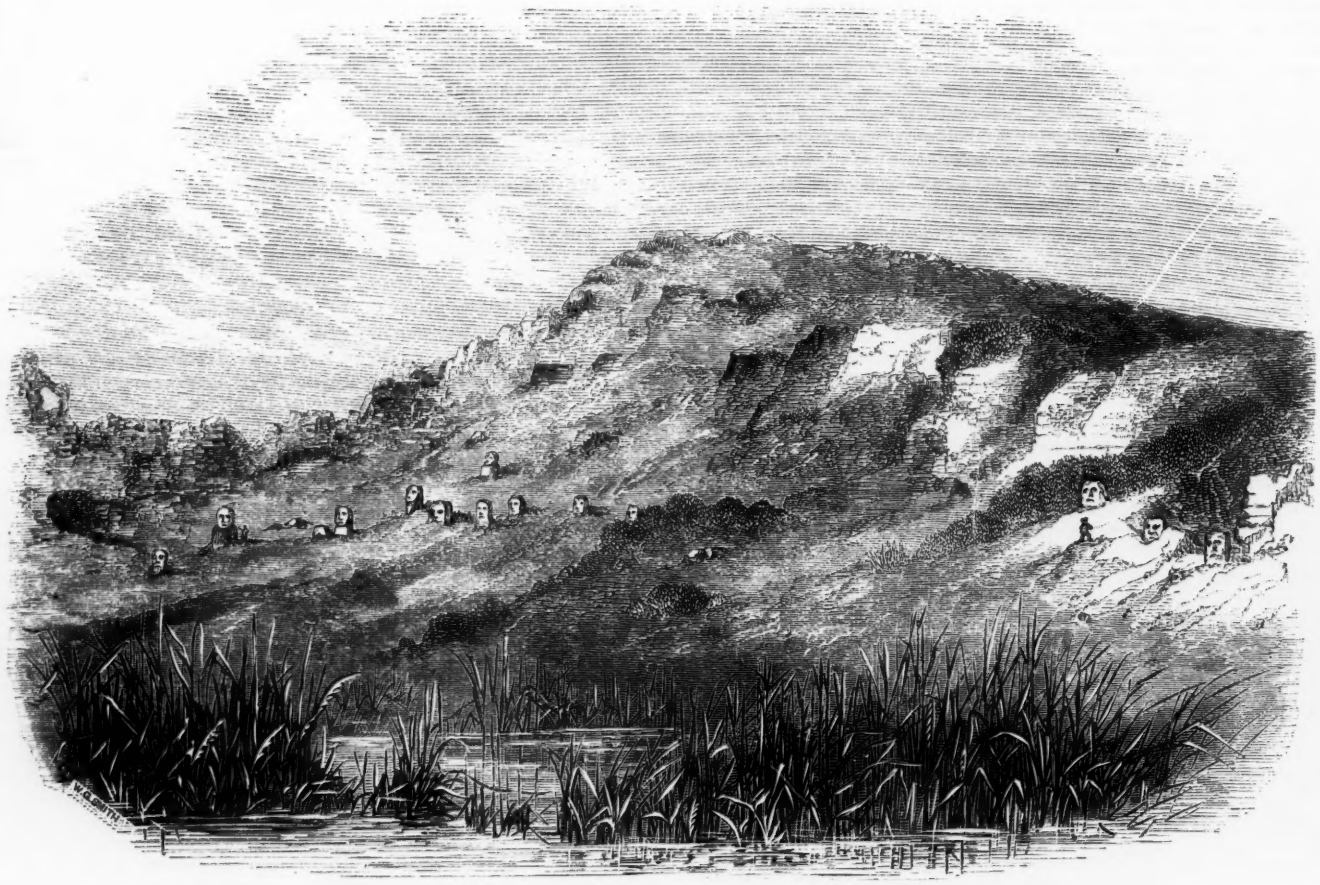
It has been proposed to fill one of the windows with stained glass in honour of John Hunter, who was a houseowner in the parish; and Newton, who was also a parishioner, has, of course, been mentioned as more imperatively demanding a proper memorial.



CHURCH OF ST. MARY ABBOTS, KENSINGTON.

Plan.

THE SCULPTURED IMAGES IN EASTER ISLAND.



View of Part of Island, with Buried Figures.

Map of Easter Island,
Mid Pacific.
About Thirty Miles round.

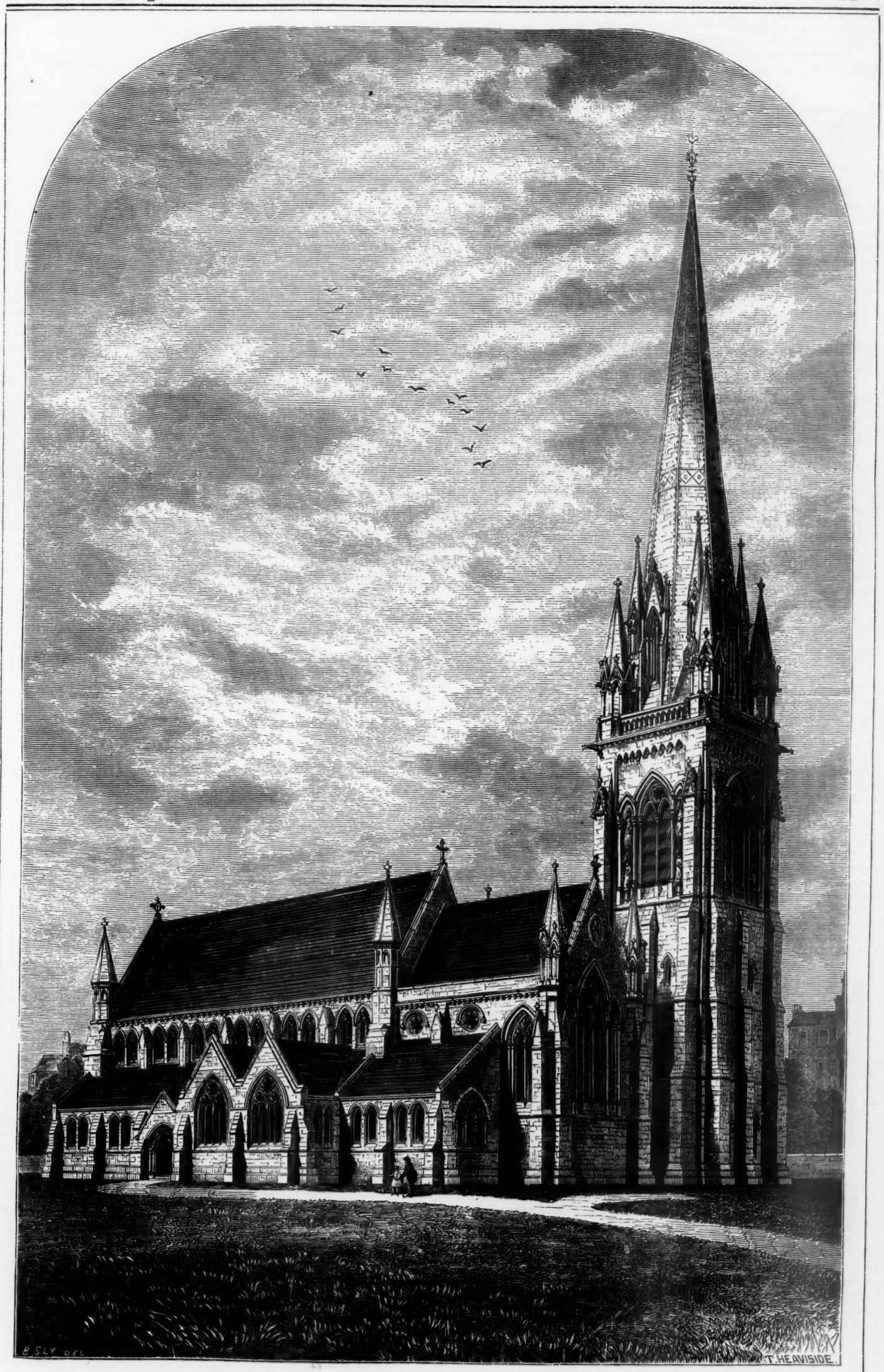
EXPLANATION.

A. { Nearly 120 figures between these
B. { points.
C. { Nearly 150 figures between these
D. { points.
E. Terano-Kou.
F. Terano-Otuiti.
G. Point from which Sketch was taken.
Between this and H,—Village, Crater where Hats are made, and Mission-house.

Prostrate Figure and Tufa Crown.

Back and Front View of Two of the Figures now in the British Museum.—Scale, $\frac{3}{8}$ in. = to 1 ft.

[See p. 4, *ante*.



CHURCH OF ST. MARY ABBOTS, KENSINGTON.——PROFESSOR G. G. SCOTT, R.A., ARCHITECT.

ANTHOLOGIA TECHNICA.

MANY inventions are turning up year after year for which would-be inventors claim the credit of original thought. In the building art, as well as in other branches, not a few of the claims put forward by individuals in the interest of the profession, are scarcely entitled to be heard except on the score of judicious revival and application. Many attempts have been made of late years to devise methods of making buildings incombustible, but none have been successful or new. Comparing the present with the past we will instance a discovery related in the *Literary Journal* of 1785, of St. Petersburg, which states that Catherine granted a premium to an inventor for making a pasteboard which no fire could consume, nor water soften; he proposed it as a necessary lining to the dwellings of his country, and for clothing ships of war. The properties of this great invention are hardly a secret at present. The incombustibility was obtained by a preparation of alum. The ancients knew the secret more than a thousand years ago. It was used in the time of Scylla at the siege of Athens. Listen to what Q. Claudius Quadrigarius says:—"Scylla then brought his forces to set fire to a tower which Archlaus had placed there. He came, he piled faggots, he set them on fire, and after an obstinate labour he could not make the tower take fire, as Archlaus had covered the planks entirely with alum."

The idea might be still improved upon if men were not ashamed to acknowledge their indebtedness to those who have lived before them. When our buildings are rendered fire-proof, incendiarism and insurances will be at a discount.

Grecian beauty by many is supposed to be an ideal, notwithstanding the expression of it in the ancient sculptures. But it is a fact that the finest living female models have existed in Greece. Count de Choisel mentions in his Travels in Tenos, one of the Grecian isles, that he found women full of grace and beauty, the finest proportions in shape, and the greatest and most pleasing regularity of feature. In the isle of Naxus, however, the females were uncouth in figure.

It is a question whether beauty or proportion depends altogether on races of people, or is influenced by climate and modes of life. In the British Islands we have seen ourselves types of female form and beauty in the peasant ranks, perfect and matchless. There is little need of our artists going to Greece or Rome for the study of types alone.

At the close of the last century there was a curious watch in the possession of Mr. Francis Marsh, counsellor at law, Dublin, said to have belonged to King Charles I., given by this unfortunate monarch to his chaplain, Jeremy Taylor. It was a plain gold watch, with a single case and a gold dial-plate. The figures on the face were raised. The maker's name was *Jacobus Markwick, Londini*. The watch was highly finished. It had originally no chain, but went by means of catgut. Bishop Taylor had a new case made for it, covered with green velvet, and studded with gold. This studding represented the bottom of a mitre, and a motto was added,—"*Nescitus Horam*." The watch at that time was in perfect order, and a celebrated Dublin watchmaker declared that there was a likelihood of its keeping good time for the next fifty years. It is said that there is another watch which once belonged to King Charles, in the possession of some person in England. Do any of our readers know anything of either of these two old timekeepers?

As antiquarianism and architecture are associated, and as the history of art is the history of civilization, the present note will not be out of place. Ledwich, the Irish historian and antiquary, supplies the following annals as evidence of the origin of the much-disputed, though never finally settled, derivation of the word "Ireland:"—

A.D. 870. King Alfred, in his Anglo-Saxon translation of "Orosius," styles Ireland "Iraland."

A.D. 891. Three Irishmen, says the Saxon Chronicle, came in a boat from Yr-lande: so the Cotton MS. has it.

A.D. 918. The same Chronicle calls Ireland "Yr-lande."

A.D. 1048. Harold flies to Yr-lande.

A.D. 1077. The Danes were shipwrecked on Yr-lande.

A.D. 1080. Adam Bremensis names Ireland "Ir-land."

A.D. 1098. Odericus Vitalis calls the Irish "Irenses."

A.D. 1105. Œlonoth, in his "Life of St. Canute," styles them "Iros."

Ledwich laboured hard to deduce that from the original Celtic Ir-in came the Ira, Iros, Irenses, and Yr-land of the Icelanders, Danes, Anglo-Saxons, and Germans, and the Iris of Diodorus Siculus, and, by a transposition of inne, the Ierne of the other Greeks. Ledwich, however, though he proved the derivation to his own satisfaction, did not satisfy his contemporaries or successors. The Petries, Donovans, O'Currys, D'Altons, and a host of others pulverised the poor doctor's hypotheses into powder, without, however, succeeding in establishing a more accepted theory.

Anything concerning Shakspeare is precious, and is admissible everywhere; for what has the immortal bard left untouched in the domain of nature and art? In a Dublin magazine, published in 1793, a writer supplies the following bit of information in relation to Shakspeare:—

"There lived in Drogheda, about fifty years since, one Guy Harrison, who boasted of his descent from Shakspeare. He said he was his grand-nephew, and delighted in speaking of his uncle. I had this anecdote from a gentleman who often conversed with him, but who was too young to take much interest in anything that related to the immortal bard. Harrison kept a little shop, in which he sold thread, tape, lace, and other small haberdashery—his circumstances were indigent. Should not some inquiry be made concerning the family of Harrison? Perhaps, if he had any children, some of them may be still living."—P. R. R.

We wonder if at this date an inquiry among the oldest inhabitants, or a search through the parish registries of Drogheda, would bring to light any trace of the descendants of Shakspeare. It is strange that Malone, his great Irish commentator, did not drop across this "waif" in his day; if he did, he would likely have hunted up the particulars when such a good chance for doing so existed.

The following Latin lines are written in the margin of page 179 of "Burton's History of Leicestershire." The volume is in the library of St. Patrick, Dublin:—

"Robertus Buxton hic jacet
Paucis notus: paucioribus ignotus—
Cui vitam dedit et morteno
Melancholia."

These lines, as it has been before remarked by another, bear a striking resemblance to the lines of Gray, in his "Elegy in a Country Churchyard," beginning,—

"Here rests his head upon the lap of earth," &c.

The volume is evidently the author's own copy, for his pedigree is thus mentioned:—

"Robert Burton, Bachelor of Divinity, and student of Christchurch, Oxon. Author of 'The Anatomy of Melancholy.' Born 8 of Febr., 1578."

Underneath, on the margin, appears the following:—"Obiit anno 1639."

The School of British Sculpture is not quite so recent as some imagine. The ecclesiastical edifices and monuments in Great Britain and Ireland furnish a proof of a high degree of excellence in stone carving. There is a great mixture of the northern element in both the Anglo-Saxon and Celtic races. In Mallet's introduction to the "History of Denmark," Wormius, Sibbern, and a few others relate the surprising skill of the Northerns in carving, and this, too, with no better tool than a knife. They were also expert at painting in colours with different clays. The Germans were also adepts at this work, according to Tacitus.

The Celts had the same propensities, and they made considerable progress in the art of design. In one of their ancient canons is mentioned how they adorned their skins with ornamental punctures of birds, animals, and flowers. Among the British there was a class of master designers, entitled "The Artifices Plagarum," who not only taught, but practiced, the art of drawing.

The Dutch have been great navigators, and as soldiers they have shown considerable bravery on several occasions. They have also beaten back the sea, and built cities upon swamps. Holland has also furnished some ripe scholars. In 1738, one Vander Muelen, who must have been a man of distinction, published at Utrecht a Latin dissertation on the "Rise and Fall of the Roman Empire"—"*De Ortu et Interitu Imperii Romani*." Not ever having seen a copy of this work, we are unaware whether Gibbon is in any way indebted to the Dutchman in the material of his great work. It would be worth the trouble of a search, if there be a copy in the British Museum or other public library.

The Holborn Viaduct is a remarkable work, but, like other important works, the greatest difficulties to its construction are now unseen. Sixtus V. embellished Rome, perhaps, as much as Henry IV. or Louis Napoleon did Paris, taking times and circumstances into account. Our mightiest works are far in the distance, and we shall yet think our river bridges and roadway viaducts small affairs to boast of. Sixtus restored the fountain of Massa, of which the source was twenty miles from Rome, near the ancient Prænesti, and conducted it by an aqueduct of 13,000 paces on arcades. The New River, for the supply of London, was accounted a great work in the time of Sir Hugh Myddelton, but what is it to-day? Art is still in its infancy, and even telegraphy waddles in its swaddling clothes. Œ.

ROSSO ANTICO MARBLE.

AT a meeting of the Royal Institute of British Architects, November 1st, the attention of the members was called, as we stated at the time, to the introduction of Greek Rosso Antico marble into this country.

Mr. Seddon, on that occasion, pointing to several specimens, said:—It is brought from a quarry in the Bay of Skutari, on the coast of the Gulf of Laconia, near the port of Gytheion, in the Morea, N. Lat. 36½°. Long before it had acquired in Italy the name of *Rosso Antico*, it was known as *Red Laconian* to the ancients, whose excavations are proved by the large blocks cut by them, and never removed, on account of the difficulty of transport across mountains and ravines; but the quarry whence these small specimens are extracted is situated close to the sea, sloping down into the sheltered and tideless Bay of Skutari; with a village of the same name above. This quarry has not been opened for any excavations of importance, and there is as yet no machinery for lifting large blocks which could be cut, or for shipping them. The marble becomes richer in colour the deeper it goes into the bed of the quarry, and is found in large quantities. Lysandros Kaftangioglou, honorary corresponding member of this Institute, a Greek architect, who is known to Professor Donaldson, sent a notice, with some specimens, to the Exhibition of 1851, by order of the Greek Government. He said:—"The largest pieces of this marble are the fourteen steps in the Church of St. Prassede, in Rome, which were intended to be carried to France, to ornament the throne of the Emperor Napoleon I. It was thought till lately the place whence they came was unknown; it was, however, near the sea at Skutari."

Within the last three months this same gentleman has, in a letter, expressed his hope that this red marble, so much sought by the Romans, who made great use of it, should be again employed for works of decorative architecture, *sousbassements*, interiors of churches and palaces, inlaid ornaments, chimney-pieces, standing candelabra in halls, &c., and also says that the opening of the quarry would be the beginning of a great working, very easy, and not expensive, from its admirable position, especially as there are facilities for water transport to London or any other port direct from the spot. Rosso Antico is extremely hard and impervious to the effects of climate. Its proximity to iron produces its hardness and colour. It has been used by Baron Triqueti in the Memorial Chapel at Windsor, and by Lord Walsingham for decorative panels in his billiard-room. The latter is perfectly satisfied with its identity and beauty; and, having carefully compared it, sees no difference between it and some ancient pieces in his possession, which he thinks it is more than probable came from the same locality.

Professor Donaldson remarked that very little was known with regard to the marble Rosso Antico, although considerable quantities were found in Rome in use for decorative purposes, amongst the objects of art on sale in that city. Milizia describes it, in his "Architettura," as consisting of two qualities, more or less coralline in depth of colour, with occasionally white or black spots; he mentions the figure of Wolf wrought in this marble in the Gallery of the Borghese Gardens. Rondelet also mentions Rosso Antico, stating that the two columns in

the Salle d'Apollon, in the Louvre, are of this material, and once formed parts of the tomb of Charlemagne at Aix-la-Chapelle. Professor Donaldson added, that there were several small-sized statues of the same marble in the Galleries of the Vatican and Capitol at Rome, and that much of it had been used in the churches there, being considered from its hardness, beautiful colour, and rarity, as very valuable.

If, therefore, the specimens exhibited were of the same or like quality, the material would be a valuable acquisition for decorative purposes.

Baron de Triqueti has since written a letter to the quarry owner, which may be usefully translated. He says:—

"After you had consulted me on the nature of your marble, and I was fully convinced that you possessed a quarry of true Rosso Antico, which is so rare and so sought after, you had the goodness to offer me gratuitously all that could be useful for the service of her Majesty the Queen, for the decoration of Wolsey's Chapel, Windsor; it is therefore my duty to give you an account of the use I have made of the blocks you sent me, and acquaint you with my observations. It is incontestable, and every one versed in mineralogy will directly admit, that your marble is the identical Rosso used by the Greeks and Romans. It is a calcareous substance, coloured by oxide of iron, containing sand of an extreme fineness, which gives its grain. It is divided by parallel layers of white; moreover, it is very often intersected by blackish veins of delicate network; while the general appearance of the marble passes from a red, almost scarlet in colour, to that of "lie de vin," or "sang-de-bœuf" (wine-lees or blood-red), probably according to the quantity or nature of the oxide it contains. I shall not waste my time in mentioning the ignorance of those who think the name of Rosso can apply only to those fragments of marble worked by the ancients. That is not worth speaking about. My experience in marble enables me to see that the small blocks I have used were taken from the uppermost layer of your quarry, and consequently show the unfavourable side rather than the beauties of the material. I had it sawn to use for slabs or bas-reliefs. Your Rosso saws very easily; it is rather less hard, than more so, than the statuary or Sicilian, and the expense of sawing is not more. The surface of the Rosso is very smooth and equal, and is worked with the greatest ease, with chisel, &c. It wears the edges of tools on account of the sand it contains, but not enough to cause any difficulties in working.

Being sensible of the confidence placed in me before you were acquainted, and wishing besides to inform my colleagues, sculptors or architects, of the qualities of this fine material, I have used it in the execution of four bas-reliefs of small dimensions for Wolsey's Chapel. I executed with my own hand four subjects, from the rough to the completion, which I had polished, as is necessary in the sculpture of coloured marble. I then executed two heads in profile, of Tiberius and Herod, after antique medals. This work is quickly done, and the result admirable. I then executed the reverse of two medals, in which greater delicacy was necessary,—Judea Capta and the Roman Wolf medals of Titus,—and was equally contented with the material. The admixture of sand in Rosso, which is so remarkable in the antiques of the Vatican at Rome and the Louvre in Paris, gives an advantage to the sculptor over the marble-worker, by giving solidity to the result and power to the subject. The dark red tone of colour marks the outlines with the force and severity which are so admirable in reddish-coloured bronzes; in short, I found your Rosso possesses the qualities requisite for successful sculpture. Many slabs which are used in the ornamental part of Wolsey's Chapel have taken a sufficient polish; others, less good in quality, have not.

Artistic persons, to whom these details may be interesting, will, I think, easily obtain admission into the chapel, and can see and judge for themselves of the quality and beauty of the Rosso from your quarry. I am convinced, by going deeper into it, that you will obtain blocks incomparably more beautiful. I hope to be enabled to make use of some; and I am persuaded that the discovery of your Rosso Antico, —*the true Rosso, I repeat,*—is destined to be of great service in architecture and sculpture."

An Enlightening Landlord. — Lord Chesham has at his own cost just had all the cottages of his tenants at Latimer fitted up with gas.

THE VENTILATION OF SEWERS.

SIR,—I beg the insertion of the following remarks on a subject of public importance in connexion with the drainage of towns.

It is well known that offensive smells find their way into houses from sewers. The public health often suffers from these noxious emanations. Yet nothing is done in many towns to remedy this evil, beyond placing what are appropriately called stench-traps at the inlets of the sewers, with the view of making them as air-tight as possible; and the consequence is, that the sewers become full of foul gases, which, at all times, in spite of the stench-traps, and especially in favourable conditions of the atmosphere, escape and generate, or aid to generate, fever and disease. In short, the atmosphere of towns is vitiated by the noxious emanations of unventilated sewers, and this is one of the greatest objections to the present system of sewerage. How many, by breathing this polluted atmosphere, are drawn to the dram-shop, the drug-shop, and the grave? Our cemeteries are prematurely full. How many of those who lie there are victims of slow poisoning by an irrational system of unventilated sewers? and how much ill-health among the living is owing to the same cause? Few diseases afflict humanity which are not aggravated by foul air.

How can this evil be removed? By ventilating sewers on the same principle as coal-pits. Connect the sewers of a house with the kitchen chimney (where there is a fire all the year round), and you have an "upcast." Remove the stench-traps from the inlets of the sewers, and they become "downcasts;" or, in other words, a current of air will pass down the inlets of the sewers, along them, and up the chimneys, carrying away all offensive smells to be dispersed in the air above the housetops, and these gases, being lighter than the atmosphere, could not descend again. By this means sewers would be cleared of the mephitic gases evolved from the sewage, and which, under the present system, escape into houses and streets. The cost of this plan would be inconsiderable, and it would not be necessary to apply it to every house.

This plan is on the principle of ventilating sewers in detail. It is opposed to the plan of having a small number of large chimneys erected solely for the purpose of ventilation, which has been tried and failed, for the simple reason that it only removed the gases from one place to another, and created a nuisance at another place. What we want is to prevent the accumulation of sewage gases, to keep them out of our houses, and to pass them off directly into the atmosphere, where they would be diluted and dispersed, and thus rendered harmless. And this cannot be done more effectually than by ventilation in detail. The more "downcasts" and "upcasts," or inlets and outlets there are, the more freely will the air pass through them and overpower their noxious gases.

I may here mention that I have heard it objected to my plan that by ventilating sewers through the kitchen chimneys you run a risk of bringing sewage gases into the house, and I have been told that ladies would not like to go into the kitchen if the chimney were connected with the sewers. This is a mere prejudice similar to that which once existed against the use of coal in houses, for burning which in the city of London a man was hanged in the reign of Edward I.; and Stowe relates that as late as 1600, "The nice dames of London would not come into any house or room where sea-coals were burned, nor willingly eat of the meat that was either sod or roasted with sea-coal fire." The pipe of the water-closet is, however, infinitely more objectionable, as under the present system it is a sort of chimney to the sewers up which gases rise in the same way as smoke ascends chimneys. This objection, too, proves my case. It evinces a dread of sewage gases, and shows the force of habit, which makes people indifferent to a serious danger which has long existed, although they dread an imaginary one. People do habitually what they would dread to do occasionally. They go fearlessly into one small room called a water-closet where there is a continual escape of sewage gases. Yet they would not like to connect another larger room, called a kitchen, with the sewers for fear of an occasional escape. But there is no fear even of that. When a chimney smokes particles of soot are forced down, but the atmosphere has no power to force down gases lighter than itself. And as the chimney causes a draught, which is increased in the day time by the fire, it would if connected with the sewers cause a large quantity of fresh air to pass through them, and render it very improbable for any offensive smell to be received in the house.

ROBERT ELLIOTT.

THE BISHOP OF LINCOLN ABOUT ART.

AT the annual meeting of the Lincoln School of Art recently, the Bishop, in distributing the prizes, urged that art was a most important element in the work of education. It appeared to him that if art did not raise men to a higher stand, it did not fulfil its mission. Art had a moralising, a humanising, and a spiritualising influence. They should endeavour to Christianise art and science, and impart to them something of a higher character. It was the province of religion to spiritualise art, and it was the province of art to illustrate religion. He would endeavour to elucidate this. In the large foundries of this city men were engaged in a laborious work—perhaps it might be called a work of drudgery—but when they were gathered together in the hall of this institution they were raised high above mere mechanical work. They could not too highly estimate the advantages of this institution. It not only prevented the gratification of sensual indulgence, but it provided a salutary preventive of crime, and liberated them from the domination of their carnal appetites, and thus introduced them into a higher latitude and a nobler element. As they were aware, some of the greatest artists were engaged in manual exercises. The first introduction of Hogarth was as an engraver of bills, but, owing to being brought into a school of art, of considerably smaller pretensions than this, he became one of the most successful delineators of the various phases of human life. He also referred to Quintin Matsys, to whose memory a monument was erected at the west end of the magnificent cathedral at Antwerp. If he (the Bishop) remembered rightly, too, one of the most distinguished landscape-painters the world had produced, Claude Lorraine, whose pictures they always gazed upon with pleasure, was the son of a pastry-cook, and for many years languished in obscurity. He was, however, brought into a school of art, and from a pastry-cook became one of the greatest of painters. He rejoiced to find that this school had far out-stripped in the race such places as Lambeth and Newcastle; that it took precedence of Liverpool, Manchester, Sheffield, Birmingham, Dublin, Bristol, and other places; and that it had even eclipsed the two Universities. He had, therefore, a right to congratulate them. But he would remind the students of thi —that a grave responsibility was attached to them; the credit of the institution was committed to their trust, and they would be answerable for maintaining the present position of the school. As had been said by a conqueror of old, to his soldiers, "Ye are my wings, on which I fly to victory," so Mr. Taylor might say to his pupils, "Ye are my wings, on which I fly to glory;" for, without the labour of the pupils, what would become of the industry of the instructor? As he (the Bishop) was about to distribute prizes to his younger friends, he wished to impress upon them that nothing could be done without indefatigable diligence. Many persons erroneously supposed that they could grasp success in a moment, and they accordingly did not give themselves the trouble of submitting to that careful, indefatigable labour which was absolutely necessary to the artist if he would achieve success. If the students would be successful as artists, they must never let a day pass without labouring at art. It must be with them in their walks, and in their private meditations. They must never depart from it, and it would never depart from them. If they did this, then, by God's help, they would be successful. Something had been said of the delightful views, seen by the educated eye, even in the flats of Lincolnshire. He was satisfied that there were beauties in this English Holland. He might, perhaps, be allowed to make a reference to a relative of his own, the late Poet Laureate, who left his beautiful home amongst the Lakes to visit him at Cambridge, and who told the speaker, in reply to his inquiry as to what beauties he could see in the flats of Cambridgeshire, that he lived in a beautiful country in order that he might see beauties everywhere. The late Sir Joshua Reynolds had said that he saw no beauties in Raffaelle and Michelangelo until he had studied their works, and then he appreciated them, and became enamoured of their beauties and excellences. The great use of material objects was

to lead them to the study of ideal objects. They might copy objects exactly, but if they did no more than this, they would, like photographers, be merely machines, working machines. They must endeavour to have an ideal in their minds, and to arrive at the ideal mould they must go to that which was spiritual and unseen. As Michelangelo, who was not merely the greatest of sculptors and painters, but one of the greatest of poets, had written:—

"Heaven-born, the soul a heavenward course must hold:
Beyond the visible world she soars to seek
(For what delights the sense is false and weak)
Ideal Form, the universal mould.
The wise man, I affirm, can find no rest
In that which perishes; nor will he lend
His heart to aught which doth on time depend.
'Tis sense, unbridled will, and not true love
That kills the soul: love betters what is best,
Even here below, but more in heaven above."

ARCHITECTURAL ENGINEERING.

THE numerous instances of failure in engineering structures of late years seems at length calculated to point to the expediency of further researches in relation to the principles upon which that so-called science is conducted.

An inquiry of this nature would be likely to embrace the present condition of many important erections which subserve the exigencies of public requirements; and probably foremost in this list might be reckoned the tubular bridge across the Menai Straits. The condition of that structure has for years past been such as to cause considerable apprehension in certain directions, and it is fairly questionable whether the circumstances may not be grave enough to render the subject entitled to more than passing comment. It may be customary, as we may be aware, in analogous cases to await the occurrence of some actual catastrophe; but instances may suggest themselves of sufficiently threatening importance to admit of departure from more jealously observed rules.

From the statement of late authorities upon the progress of engineering science, the development of it would be made to appear coincident with the more extended application of iron to structural purposes.

As a constructive art, perhaps, the value,—or, it may be said, the more essential features,—of scientific engineering might be capable of being closely identified with the employment and adaptation of iron in the direction intended, subject or open to improvements in the method of its application corresponding with changes which may have been from time to time introduced in connexion with its production and manufacture.

The practice of modern engineering could, in accordance with these views, and in an important sense, be said to depend upon the theory and determination of the elastic properties of iron. As one of the more singular qualities of this material,[1] it has been discovered that its resistance is not constant or uniform when exposed to dissimilar strains. This is true of its molecular cohesiveness when pressed as of its adhesive properties when pulled. It seems to possess no elements of constant strength, even where it may not be subjected to dissimilar strains. A bar of iron, which might remain intact under a gradually applied strain of 50 tons, would give way under a suddenly applied strain of 30 or 40 tons, as the case might be, and steel has, under strains of this description, been known to have possessed fewer elements of strength than iron, it being susceptible of ready fracture by a trivial blow, if suddenly applied.

It is not without a certain recognition of these qualities that the art of building in iron has been sought to be more widely extended, and their recognition does not necessarily exclude the consideration of other associated properties of iron of a more or less favourable character, perhaps, and which may deserve to be attentively weighed in instances of its adoption.

The stability of suspension structures, which are believed to well exemplify the general properties of iron, as well as affording instances of its more favourable appliance, is eminently dependent upon the assumed elastic properties of the materials of which such structures may be formed, and probably there may be but few constructions in which iron is seen to be largely employed which do not exhibit at some parts, if not at cardinal parts, the elements of the suspension principle.

From the inherent qualities of iron, it would seem to have been derived that greater advantages may be claimed as to its adaptation in proportion as it may be applied constructively to sustain pulling or tensile strains.

Occasions may be adduced, no doubt, of its employment in other forms as in the roof of the new terminal station of the Midland Railway, in vertical supports, compression arches, and in the more recently projected system of continuous tubes.

What we would more especially note at this point is that it would appear to have been unequivocably shown that the action or ultimate strength of equal quantities of iron and in replicate forms varies as to the method in which it may be employed, and that the difference is in favour of its application in its tensile capacity.

The variation in the degree of energy or strength of resistance which iron is seen to possess when it may be employed respectively in the form of a normal or inverted arch, while embodying one of its more obscure properties, may be taken to indicate the economy and expediency of certain modes of its adoption as a building material.

A beam of iron placed over a certain span would, in proportion to its length and weight, be accumulating the elements of eventual rupture; while one-twentieth part of its substance, if suspended above it, would by connexion with the beam admit of the passing over of superadded loads. It was proposed, we believe, some two or three years since, by Mr. Cowper, of the Institution of Civil Engineers, to construct bridges with inverted instead of upon normal arches in iron, as an intermediate class of erection between suspension and ordinary arch-formed structures of the nature in view; but Mr. Peter Barlow observes that if the back chains of a suspension bridge were removed, and a compression tube applied uniting the extremities of a curved suspension chain, four times the quantity of metal would be demanded to obtain equal rigidity, and it appears that this costly element would not be altogether escaped in inverted arch bridges.

The deflection of beams or girders from their own weight alone, and their increased deflection by superadded weights up to the point of rupture, is said to coincide with the development or generation of series of strains whose direction may be shown, and which, arriving at certain localised parts, may be seized and conveyed away by appropriate connexions and means to the relief of the structure, as electricity may be carried away from accumulating points by conductors. It is asserted that no reliance may be placed upon the section of metal required in cases of large span, and that by no calculation can the point be arrived at with certainty when distortion will commence; but the observation is more intended to apply, as regards iron structures, to those not included in the suspension system.

Architecturally considered, all attempts to blend modern engineering theories with more established usages of building have resulted less happily, perhaps, than could have been desired.

Especially with reference to disasters incident to the construction of roofs, perhaps where iron may have been largely employed in conjunction with masonry, more particularly may this be noted. The distrust which at one time culminated in the proximate fall of the building which was erected for the purposes of the International Exhibition of 1862, at South Kensington, may be well borne in mind. The apprehension to which that circumstance gave rise has been scarcely diminished to the extent that could be wished by analogous occurrences of later date. In this direction it would seem, in an engineering point of view, that eminent scope would be afforded for further inquiry into the merits of the system embodied in the St. Pancras Station.

No ordinary arch-formed roof in iron of great span would appear to be intrinsically or necessarily safe. The rupture of the tie-bars, by the tendency of the limbs of the arch to spread, or the contraction of the span and demoralisation of the members supporting the structure by a negation of the action which they may have been originally intended to fulfil, are among some of the causes tending to disturb and imperil the stability of modern iron roofs of the description alluded to.

These elements of instability are observed to have been well avoided in the St. Pancras roof. This structure is in the form of an obtuse pointed Gothic arch, composed of two immense limbs of built-up ironwork, uniting in the centre of the span, at a height of 160 ft. from the springing, and may be considered to be altogether independent of the architectural elements by which it is surrounded. The ribs, comprehending a span of 245 ft., are continued in a series of twenty-five principal and a corresponding number of inferior ribs, which constitute the main frame-work of the building; and apart from its being the largest roof yet constructed, it possesses claims of scientific importance as the direct antithesis of that system which is advocated by the engineer's brother, Mr. Peter Barlow, as to the economical and practical adaptation of iron to structural purposes. Reverting for a moment, and in view of the late occurrence at King's College, to the self-inflicted rupture of continuous horizontal girders or beams, such members, if altered to the form of an arch, would have the point of probable rupture translated to new localities, and admit of a certain margin of useful effect.

The direction of the tendency to rupture might then be regarded as having been diverted down the opposing limbs, accumulating and being retained or conveyed away at their base. Should sufficient extent of metal, however, not be provided at the extremities of the limbs within which the accumulating and applied strains could be taken up, the structure would rupture at these parts from compression. To meet this a pyramidal extension may be noted at the base of the arched limbs of the Midland roof, and may be compensated for in other arched form structures in iron by spandrels and other substituted means.

The study of the science of engineering has been compared by Mr. Fowler to the study of the science of medicine. The resemblance, however, would not appear to be intended to be too widely conveyed, and it forms no part of our duty to seek to inquire how far or not the comparison should be extended.

Mr. Fowler observes, that "although we know from history that men have existed from the earliest times who have been distinguished by great mechanical capacity, remarkable skill in working materials, profound science, and constructive knowledge; yet it is only during the present century that civil engineering can be considered to have become a distinct and recognised profession. Now, however, it has assumed the position of an art of the highest order. Perhaps we may, without arrogance, be entitled to claim for it the title of a true science. Many attempts have been made to define and describe a civil engineer in a few general words, but all such attempts have been more or less unsatisfactory."

While some might, perhaps, regret the irresolution which has been declared as to the discovery of some more intelligent designation of an important body, a less unsatisfactory approach may be made in this direction in proportion as their labours extend over a wider experience. Be this as it may, it would appear but a capable hardship, should a science confessedly of such immaturity be led in order to steer altogether clear of any imputation of arrogance, while retaining all the elements of a science, postpone its claims, for the time, to the dignity and confidence of a true one. It is a science which, perhaps, cannot yet be said to be so free as might be wished, from occurrences that may associate themselves in some degree with the attempts to which Mr. Fowler has referred, if not to point to the expediency of a suspension of judgment as to the position which should be assigned to it amongst leading arts.

The annals of engineering, although voluminous, do not appear to bridge over any wide historical interval, as Mr. Fowler has remarked, but it is said rather to be founded upon the discoveries of comparatively recent times. Mr. Humber says as the reader escapes from the preamble of his subject that "he will then come to the period when the rude constructions of the inhabitants of China and the Himalaya mountains of India suggested the mode of passing over chasms and rivers by means of a suspended way." From this point one is briefly led to the erection of the first iron bridge over the river Tees. After the erection of this structure, it is stated that more than half a century had elapsed, when we arrived at what is regarded as the culminating point or crisis of practical engineering embodied in the erection of the Menai Bridge.

The degeneration of this structure has long attracted attention in engineering circles, and may be calculated shortly to invite a consideration of the means by which it may be strengthened or superseded by an improved connexion. As we have already noted, the science of construction in iron or architectural engineering is said to have taken its more prominent features

if not its accepted date, from the period of the erection of this structure. But many of the conclusions which were then arrived at no longer coincide with the tendencies of modern engineering with reference either to the ascertained strength and properties of materials or their mode of application.

Mr. Clark states that "with respect to the use of the present suspension bridge for the proposed traffic it was found difficult to devise any means of sufficiently strengthening it that did not involve an almost entire reconstruction, and great difficulty was similarly found in attempting to render any suspension bridge sufficiently rigid for railway traffic by means of ordinary trussing. When the passing load is small compared with the weight of the chains and of the structure itself, there is, indeed, no difficulty; but the construction of a platform, 450 ft. long, sufficiently rigid for railway traffic, almost amounts to the construction of the tube itself." These difficulties will be seen to have been overcome, and the conclusion which was arrived at altogether set aside in presence of the span of Niagara Bridge, which is nearly twice 450 ft., and has yet been rendered sufficiently rigid for the purposes of locomotive traffic, to the exclusion of all resemblance to a tube, and affords a notable economy of material as compared with the Menai structure.

There are also more modern instances of improvement. Since the time of Brunel, who did with reference to the flexible adaptation of iron what Sir Charles Fox did with that material in another form in the Exhibition of 1851, the application of iron to building purposes has undergone wide and important changes, and the science of engineering cannot yet be said to have reached any determinate form. It is a quality of engineering science to adapt its designs to special circumstances, and consequently it never ceases to be experimental—a circumstance which is greatly to be regretted, perhaps, in the interests of that science. This may be instanced in the curious and interesting succession of bridges lately erected over the Thames in cases even where the circumstances and the requirements were alike; and it is this experimental feature which, in our view, somewhat detracts from the practical value and importance of the science, and would in a measure naturally be the case where every newly-projected undertaking can be regarded as upon its trial.

From more recent investigations upon the strength and durable properties of iron, it is possible that its application in a structural point of view may be brought more and more within the limits of an exact science, but until that time arrives those who may be concerned in important architectural works will be more solicitous as to the ultimate advantages of its more extensive adoption.

Standing alone as an independent and important branch of constructive science, the art in view may advance more truly to its aims, and eventually claim that recognition which Mr. Fowler appears at a loss to imagine should by some portions of the public be now withheld from it, and which might well be attributed, as his words could at the present moment be taken to suggest, to bewilderment either in or out of the profession.

THE LABOURING CLASSES IN AMERICA.

THOMAS CONNOLLY, stonemason, who went to America on the part of brother-workmen, we believe, to report on the position of the trades there, has written a sensible letter to the *Telegraph*. We reprint a part of it referring to the houses of the poor and the labouring classes:—

The rich can be well housed everywhere; but how fares it with the poor of New York, of whom there are quite as many in proportion to the inhabitants, as in any other city of the world? You will find as many idlers around the liquor-stores, as many beggars and Arabs in the streets, and more people crowded into the tenement houses than I ever witnessed in the most populous parts of London. In fact, all the working people live in those tenement houses from five to seven stories high, of which there are some 20,000 in New York. In most of these houses as many as thirty-six families live; and I was in one of about 24 ft. frontage, which contained fifty-two families. The people here are packed as close as herrings in a barrel, and are in some parts twice as many to the square mile as in any city of Europe. In their construction not the slightest attention is paid to light or ventilation. They are usually four rooms in depth,—the centre ones lighted from the front and back rooms. You have to grope your way up the staircase; for it is without light from top to bottom. The water is plentiful enough, and always on. New York receives 60,000,000 gallons per day from the Croton River, about thirty miles off; but from the rocky nature of the ground upon which many of the houses are built, it is impossible for the drainage to be perfect; and were it not that New York is swept by the clear sea breezes, I do not hesitate to say that most of those houses would be hotbeds of misery, disease, and death—more especially in the houses where the poor tailor is worked to death, where the son of St. Crispin has to work far into the night to earn a living, and the poor seamstress, "weary and worn," as in the old country, is "plying her needle and thread" to provide a scanty living for herself, and, perhaps, her little ones. Another Peabody is wanted here; and some say that he will be found in Mr. A. T. Stewart, who, by a happy coincidence, is a native of the British Isles. I learn that he contemplates building homes for working people at some distance from the City, and constructing a railroad to them. I hope, for the sake of my fellow working-men here, that the statement may be true; but, in my opinion, they could do a deal for themselves if they had the will; for across the rivers to Brooklyn and Jersey there are some twenty ferry-boats running every five minutes, and in those places homes are better and cheaper. But men will be near their work if they can, even at the sacrifice of health and life. Those miserable, uncomfortable, unhealthy flats in the tenement houses are let at from 30 dollars to 40 dollars per month; so that a working man with a wife and a couple of children cannot get the poorest house accommodation for less than 12 dollars per month. The houses are all heated with stoves, in which anthracite coal at 12 dollars a ton is burned, and on which the cooking is all done. Every family has its own stove, which they remove like any other piece of furniture, when about to leave; they economise fuel, and heat the rooms much better than open fireplaces; and they could be used with much advantage where fuel is dear in England. It fares little better with single men and women, who, through emigration, are in vast numbers here; they live in boarding-houses, which are nothing more than one of those tenement houses, fitted with beds in every room except one, on the ground floor, which is set apart for meals. The inmates pay from 6 dollars to 7 dollars a week, and I admit that the food is very good. There is meat at every meal; breakfast before they go out at seven in the morning, dinner at twelve, and tea at six p.m.,—no supper, like working men in London. A large bell summons all to meals, and if you fail to attend you get nothing till the next time. On Sundays or holidays you keep your bedroom, or go out. Food here is about the same price as in England, but not so good. Without entering into details, which I must reserve for future letters, when I describe the condition of the trades, my present conviction is, that a working man in any trade here does not enjoy so much social comfort as a man of the same trade in England, with both in full employment.

THE SPACE AT THE MANSION HOUSE.

WITH reference to the memorial of the Royal Institute of British Architects pointing out the necessity and desirability of leaving the triangular piece of ground as it is, unbuilt on, and the refusal of the Metropolitan Board to accede to this request, it has occurred to me that the Metropolitan Building Act, 1855, compelling streets to be of not less width than 40 ft., ought effectually to stop the present scheme for building on it.

NEMO.

EXPERIMENTS ON TIMBER.

AN engineer writes,—

Having been permitted, through the courtesy of Messrs. Bayly & Fox, timber merchants and owners of saw-mills and creosoting works in Plymouth and at Oreston, to be present at the inspection of a number of pieces of wood prepared to test the value of various processes for the preservation of timber for sub-marine work, I send you the enclosed statement of results, thinking it may be interesting to many of your readers. The experiments have been made at the Great Western Docks here in still water, 20 ft. deep. The wood has been constantly covered for nearly two years and a half. The blocks have hung one over another on a chain which passed through them; a distance of about 10 in. being kept between each, and the whole attached to a heavy mooring, and sunk. Having again sunk the whole, it will be very interesting to note the effect which longer immersion will have upon them. My own opinion leads me to think the value of the creosoting process over any other will be more apparent each year, and that at the end of a further term of two years there will be little, if any, of the unprepared pieces of pine remaining.

The timber was sunk in the Great Western Docks, Plymouth, on the 19th of June, 1867, and examined on the 9th of December, 1869.

Preparation of the Timber for Experiment.—The timber to be creosoted was dried under a shed, with full circulation of air, for six weeks, then creosoted under pressure, from 45 to 50 gallons of oil to the load being absorbed.

Timber to be kyanised was dried as above, then steeped in a solution of corrosive sublimate during 24 hours for each inch in thickness. Three pounds of sublimate per load (50 cubic feet) being used.

Timber for the sulphate of copper process was dried as above, then steeped for 14 days in a solution of sulphate of copper, 1 lb. to 8 gallons of water being used.

Timber unpreserved was also dried as above.

Description of Wood.	Scantling.	How prepared.	Condition on Examination.
Quebec Yellow Pine	10×10×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Very slightly worm-eaten.
Ditto	,,	Unprepared	Much worm-eaten and reduced in size.
Ditto	,,	Sulphate of Copper	Much worm-eaten.
Quebec Red Pine	10×10×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Much worm-eaten and reduced in size.
Ditto	,,	Sulphate of Copper	Much worm-eaten.
Memel Timber	10×10×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Very slightly worm-eaten.
Ditto	,,	Unprepared	Much worm-eaten.
Ditto	,,	Sulphate of Copper	Rather worm-eaten.
American Oak	6×6×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Slightly worm-eaten.
Ditto	,,	Sulphate of Copper	Very slightly worm-eaten.
American Elm	6×6×6	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Much worm-eaten.
Ditto	,,	Sulphate of Copper	Very slightly worm-eaten.
English Elm	6×6×6	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Much worm-eaten.
Ditto	,,	Sulphate of Copper	Very slightly worm-eaten.
English Oak	6×6×6	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Very slightly worm-eaten.
Ditto	,,	Sulphate of Copper	Perfectly fresh and sound.
English Beech	10×7×2	Creosoted	Ditto
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Much worm-eaten, with growth of weed.
Ditto	,,	Sulphate of Copper	Slightly worm-eaten, with growth of weed.
Swedish Timber	10×8×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Ditto
Ditto	,,	Unprepared	Much worm-eaten and reduced in size.
Ditto	,,	Sulphate of Copper	Much worm-eaten, with growth of weed.
Pitch Pine Timber	10×10×5	Creosoted	Perfectly fresh and sound.
Ditto	,,	Kyanised	Very slightly worm-eaten.
Ditto	,,	Unprepared	Much worm-eaten, with growth of weed.
Ditto	,,	Sulphate of Copper	Slightly worm-eaten, with growth of weed.

THE METROPOLITAN RAILWAY.

DESPITE the complaints that have frequently been made, and are still occasionally made, of the management of the Metropolitan Railway, the number of passengers who have availed themselves of its trains has steadily increased from the date of its opening. In the first year the number of passengers carried over the line was 9,455,175. During the year just closing it is estimated that the number of people conveyed over the system—very much extended since the last-mentioned date—will be no less than 40 millions! The whole number of passengers who will, it is estimated, have made use of the line up to the end of the year 1869 is just over 150 millions! These figures are too large to convey any very definite impression to the mind. The greatest number of workmen who have been carried by the trains appropriated to their use in one week has been 18,675, and the number carried in the half-year ending June 30th was 342,174. A good deal is being done to improve the ventilation of some parts of the tunnel, and of one or two of the stations. At Portland-road, for instance, the tops or coverings have been taken off the two domes, and by this means a constant supply of fresh air is admitted into the station. At Gower-street a still greater improvement has been effected by the purchase and demolition of two houses, one on either side of the line. In this way open access has been provided to the platforms, and this, which was until lately the worst, will now be one of the best ventilated stations on the underground portion of the railway. The construction of the St. John's-wood branch was a great aid to ventilation; and a scheme has already been sanctioned by the Board of Directors for making an opening in the roof between Gower-street and King's-cross.

MRS. TAIT'S ORPHANAGE, ST. PETER'S, THANET.

THE foundation-stone of a permanent home for orphans, initiated by Mrs. Tait, wife of the Archbishop of Canterbury, has been laid on a site near the Archbishop's marine residence, Stonehouse, St. Peter's. We understand it will be in the Gothic style, and will be 100 ft. long and 60 ft. wide. The dressings will be of Doulting stone, the internal walls being built of brick, faced with flints obtained in this neighbourhood. Red bricks will be introduced as bands and relieving arches; and the entire building will be covered with tiles. Accommodation will be provided for about sixty orphans belonging to the Canterbury and London dioceses, who will, under the direction of Mrs. Tait, be in the care of sisters from St. Peter's, Clapham. A chapel will be erected, 59 ft. by 18 ft. The cost of erection will amount, it is estimated, to nearly 6,000*l.*, of which 2,600*l.* have been obtained up to the present time. The building is to be finished and ready for occupation by April, 1871. Mr. J. P. Seddon is the architect; and Mr. Thos. Williams, of Kentish Town, is the builder.

THE GRANITE COLUMNS OF THE HOLBORN VIADUCT.

SIR,—The publication of the report of the engineers appointed to examine the piers of the Holborn Valley Viaduct Bridge over Farringdon-street, affords to the proprietors of the Ross of Mull Granite Quarries, from which the red granite of the piers was quarried, the opportunity of explaining the cause of the giving way of these stones, and inquiring publicly what departure from Mr. Haywood's original design is referred to in the report of Messrs. Clark, Bidder, & Harrison. I send you copy of tracing of the piers, furnished to me by Mr. Haywood's orders nearly three years ago. This tracing was furnished in order that I might give an estimate to him of the probable cost of these piers. You will observe in this tracing joints are shown at 12 in. from the bottom of the Ross of Mull granite, and at 9 in. from the top of the same granite. As it has been proved that the fracture of these 12-in. and 9-in. stones has been caused by hollow beds, and the improper use by the contractors of detached bits of lead, instead of a continuous sheet or ring of that metal, the matter that I wish now to elucidate is, that these comparatively thin stones upon which the whole weight of the superstructure would be imposed formed part of the original design, and the reason for that being the case.

When the design was shown to me in February, 1867, and the time (about twelve months thereafter) within which the work was to be finished was named, I represented that it would be much easier to have the work done in the time were the piers circular in form instead of the form shown in the drawing; the reason of this being, that the time taken by the masons in preparing, and by the machine-men in polishing, would be considerably shortened by the adoption of the circular form. To this Mr. Haywood would not consent; therefore the thin and, unless carefully laid, weak pieces of stone were retained in the design.

I have frequently admired the patience with which the inhabitants of London submitted to the great inconvenience of the opening of this noble Viaduct being so long deferred, mainly that the piers of this bridge should be angular instead of circular, and the great simplicity with which Mr. Deputy Fry explained that the delay was from the difficulty in getting possession of the ground, ignoring the fact that the arches of the roadway both east and west of Farringdon-street were completed many months before the bridge, the land for which was to be had for the taking. Mr. Fry has been rewarded by the 500 guineas' worth of plate, and the public by the sight of fractured piers.

The proprietors of the Ross of Mull granite quarries are too well aware of the excellent qualities of the stone to fear much loss from the exaggerated reports of the damage done to these piers. We knew that when the truth came to be known, it would be found that the stone was not at fault.

The massive columns of Blackfriars Bridge were taken from the same part of the quarries; and I have been informed by Mr. Carr, the engineer of that structure, that he ascertained by experiment with a polished piece of Ross of Mull granite, 3 in. in diameter, *evenly bedded*, that the crushing point was nine tons per square inch, or one hundred times more than the weight borne by the fractured piers at Farringdon-street.

G. W. MUIR.

P.S.—It is necessary I should explain that although the fractured stones were taken from the quarries at the Ross of Mull, the proprietors are not in any way responsible for the quarrying, dressing, polishing, or fixing of these stones, these operations having been undertaken by the contractors for the Viaduct.

LANDLORD AND TENANT.

SIR,—The case of Davies *v.* Remmett, reported in your last issue, in which the jury found a verdict for the landlady of a house let furnished, but more or less uninhabitable by reason of defective drainage, the tenant relying on an implied warranty, is instructive, as confirming in degree the obliteration of a nice distinction in our truly feudal laws of landlord and tenant,—laws made evidently by legislators who occupied the former rather than the latter position. That there is never any covenant or promise implied at law on the part of the landlord on letting an *unfurnished* house that it is reasonably fit for habitation, is clearly established; but that, on the contrary, there is such an implied warranty on letting a *furnished* house, is imagined by many to be settled law; and so Lord Campbell ruled. Judges, however, differ on the second point, and have since differed, the balance now being against the tenant. Cole, in "Woodfall," last edit., says,—"It was once decided that there is an implied condition in the letting of a furnished house that it shall be reasonably fit for habitation, and not so infested with bugs as to make it uninhabitable. But such decision is not to be relied on: it has been greatly shaken, if not overruled, by subsequent cases." Archbold, third edit., reiterates the above cases, adding, "That, at all events, if the house be let (furnished) upon lease, there is no such implied warranty. And the better opinion seems to be, that the only implied agreement upon the part of the landlord is for quiet enjoyment, in the ordinary legal sense of that term; that is, without disturbance by the landlord or any person lawfully claiming under him. An agreement letting for only one year, or for a less term, may, of course, amount to a lease; and, to be on the safe side, as Lord Wensleydale observed, in an important judgment touching an unfurnished house, "When parties mean that a lease is to be void on account of unfitness of the premises for the subject for which they are intended to be used, they should express their meaning." E. L. TARBUCK.

THE THEATRE.

Covent Garden.—In respect of art, the pantomime at this house, "The Yellow Dwarf," stands at the head,—an easy first. It is, in fact, a remarkable work. The first scene, "The Wicked Haunt of the Yellow Dwarf" (painted by Dayes & Caney), with its weird rock-cut figures, and the extent of its cavernous depths, is an artistic production; though how a Haunt can be wicked, unless the H is there by mistake, we do not know. The same artists also supply an effective scene of the Royal Gardens, and a view of the Crystal Palace from the Gardens, for the harlequinade. The Gardens of the Palace, by Mr. Telbin, jun., the Haunt of the Houris by Mr. Hawes Craven, and the Transformation-scene by Mr. Julian Hicks, would each make an exhibition cheap at a shilling apiece the first two, and half-a-crown the third. This last, termed the Roses of Fairyland, is brilliant and refined. When we add that the groupings have been arranged by Mr. A. Harris, the words written by Mr. Byron, the costumes designed by Mr. Matt. Morgan, and that all the parts are pleasantly filled, Mr. F. Payne's *Twitterino* being the most remarkable, we shall have said enough to send many to Covent Garden who do not usually care for pantomimes. Mr. W. Telbin, we ought to have mentioned, has supplied a view of the Thames Embankment and the Houses of Parliament, which is a perfect picture.

The Surrey.—We must give a warm word of praise to Mrs. Charles Pitt for the improved taste observable in the Surrey pantomime this year. The scenery, by Mr. Albert Callcott, and the dresses are altogether admirable. The transformation scene is gorgeous.

Intended Theatre, Leicester-square.—The proposed elevation of the theatre about to be built, it is asserted, on the north side of Leicester-square, and described in our pages some weeks ago, is a very poor affair, as unlike a theatre as it is possible to conceive.

BREAKAGE OF GLASS IN BLANK WINDOWS.

BELIEVING I have now discovered the real cause of breakage of the black enamelled glass in blank windows at Longleat (referred to in my letter of the 20th March last), I feel it my duty to ask you to make it known through the *Builder* for the benefit of others.

I examined some of the damaged squares during a hot day, about Midsummer, and found them very hot to the hand in the centre, but comparatively cool round the edges, where they were inserted in the stone mullions. I was at once struck with the conviction that the breakage was caused by unequal expansion, the central portion expanding more than the edges, producing a fracture of this kind, the glass seldom falling out. I have since inserted a number of squares in wood fillets flush with the stone mullions, the glass being stopped in as in ordinary sashes. These stand well, none of them being broken. W. BUCKENHAM.

FATAL ACCIDENT AT THE NEW THEATRE, BRISTOL.

MOST of our readers will have heard of the terrible accident at the new theatre in Park-row, Bristol, which resulted in the death of eighteen persons, and the injury of several others. The entrance to the pit and gallery is down a passage about 20 ft. wide, leading from Park-row. There is a steep gradient from the level of the road, and at the bottom of the passage there is a sharp turning leading at right-angles to the gallery on the left. The door to the pit is situated also on the left-hand side, but about 2 ft. higher up, and consequently nearer the roadway. It is impossible to compute the exact number of persons in the passage; but it is stated by several policemen who were near the spot that nearly 2,000 persons were endeavouring to gain admission either to the pit or gallery—the crowd extending some distance into the roadway. As the minutes wore on the crowd grew denser, and the pressure from the outside packed the mass in the passage closer and closer altogether. Directly the doors were opened those behind pushed forward, heedless of the cries of those in front of them. A policeman, desirous of restraining the advance of those behind, called out "Fire!" A panic was the result. Men, women, and children immediately made a frantic effort to drive back those coming in. People were pushed down and

trampled under foot, and when once down it was almost impossible to recover their footing. In some of the newspapers we have seen the width of the passage, 20 ft., referred to as increasing their surprise that the accident occurred. The fact is, however, that in this width of passage was the element of danger, increased by the steep descent. Any arrangement which permits a mass of people to be clustered together as they were here is a bad one. The French for years have shown us an example by forming the persons waiting into a narrow *queue*, which is controllable at any point; but the lesson is lost upon us. Every day it becomes more obvious, especially in the face of the existing mania for building theatres and music-halls in London, that proper regulations and strict supervision are needed with reference to the erection of public buildings.

LEEDS BRIDGE COMPETITION.

GREAT dissatisfaction is expressed on the ground that, although it had been stated no one connected with the corporation would compete, their surveyor, with whom various competitors had discussed their views, has been allowed to do so. Exception is taken, too, to Mr. Barlow's selection of three designs, all requiring, according to his own showing, important alteration. The joint engineer of Blackfriars Bridge, who is a competitor, has published some strong and pointed assertions on the subject.

ETYMOLOGY OF THE WORD "HOLBORN."

THE recent opening of the Holborn Viaduct has naturally awakened fresh interest in the etymology and application of the word Holborn. Among others, the *Illustrated London News* has lately taken up this subject; it is also incidentally alluded to in Mr. Trollope's magazine, *St. Paul's*, in the article called "The Thames." Both writers adopt the old opinion which considers it a corruption of *Old*-bourne. This appears to me a great misconception; I do not deny that it has been called Old-bourne, but not correctly so, as I think.

The prefix *Hol* in Holborn really means a hole or hollow, as in the analogous cases of Holbeck and Holbrook: places in England, named in a similar way, bourne or burn, beck, brook, being synonymous words for a small stream of moving water.

Holborn is thus mentioned in Domesday-book, the old Norman survey of England, compiled by orders of William the Conqueror; it is there recorded that "the king has two cottiers at *Holeburne*, who pay twenty pence a year to the king's vice-comes [sheriffs]." There can be no doubt that Holeburne, in Ossulstone hundred, Middlesex, is meant for the Holborn of the present day; and it would, therefore, appear that "Hol" is the older, and more correct form than "Old;" the use of which latter form served to mislead Stow, the chronicler.

Ald, the Saxon form of Old, could not have been corrupted into "Hole," so near to Saxon times as A.D. 1086, when the great survey was completed.

A. HALL.

RAILWAY AND TRAMWAY BILLS, 1870.

THE budding-season, so to speak, of the Private Bill business of the coming session is now past, copies of the Bills to be petitioned for having been lodged as required by Standing Orders on the 23rd of December current. The number of Bills deposited, 239, is considerably larger than the number lodged last year—212; but the number of Bills involving new works is considerably smaller. The latter class of Bills are encumbered by the additional Standing Order that the plans of such works, with books of reference to the property involved in the construction, have to be lodged in the Private Bill Office on or before the 30th of November.

In the approaching session ninety railway Bills will be petitioned for, and twenty-two tramway Bills. Many of the railway Bills relate to abandonment of authorised works, extension of time, and "capital" arrangements; but comparatively few are for new works, and of these only a small number are for schemes of engineering importance. Amongst such may be named the Tay and the Severn Bridge schemes, and the East and West Metropolitan Junction Mansion-house Railway scheme, to the character of which attention was directed in a previous number of the *Builder*. The street and road tramway Bills include some half a dozen for the metropolis; two each for Glasgow, Manchester, and Birmingham, with others for Dublin, Leeds, Worcester, Plymouth, Wallasey, and other places. The remainder of the Bills relate to gas and water supply, local improvements, piers and harbours, canal and river navigations, roads and bridges, markets, and miscellaneous. The proportion of the comparatively small number of Bills petitioned for that is to perish in the bud, or to be thrown out upon Standing Orders, remains to be seen.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Report read at the annual general meeting, held December 21st, showed that the actual numbers of the four classes,—honorary members, members, associates, and students,—were 16, 655, 920, and 148 respectively. The ordinary receipts for the past year had amounted to 7,032*l*., being only 141*l*. less than they were in 1868, notwithstanding the loss of dividends due to the sale of stocks necessary to meet the expenses of the new building. The expenditure in the same period (exclusive of the new building) had been 3,786*l*. During the financial year ending on the 30th of November last, a sum of 8,498*l*. 5s. 6d. was paid on account of the new building and its accessories, making, with the sum of 9,711*l*. 16s. 10d. expended up to the date of the previous annual meeting, a total outlay of 18,210*l*. 2s. 4d. This outlay had been entirely defrayed out of the funds of the Institution, viz., 10,246*l*. 1s. 8d. by the realisation of investments, 2,209*l*. 16s. 2d. from the Locke Gift and Bequest (which have been received too recently to be invested), and the balance, 5,754*l*. 4s. 6d., from the surplus income of the last two years. It should be mentioned that the building fund proper had only contributed 5,712*l*. 5s. 10d. towards this outlay. The remaining balance of 12,497*l*. 16s. 6d. had been obtained from the general funds,—an amount which the building fund fees, on election, would not be able to reimburse for the next quarter of a century. The nominal or par value of the several funds under the charge of the Institution, on the 30th of November last, was,—I., general funds, 7,656*l*. 1s. 8d.; II., trust funds, 12,119*l*. 15s. 8d.; and III., cash balance, 268*l*. 9s. 9d., making a total of 20,044*l*. 7*s*. 1d., as against 29,835*l*. 18s. two years ago, when they were at a maximum. This showed a decrease in the interval of 9,798*l*. 10s. 11d.; but it was to be remembered, as previously stated, that in that period a sum of 18,210*l*. 2s. 4d. had been paid on account of the new building.

On Tuesday, January 11th, Mr. Vignoles will deliver his address as President.

CONTRACTS FOR ROADMAKING, SEWERAGE, &c.

SIR,—You have been calling attention on several occasions to the great discrepancies between the tenders for works of this kind, and they have certainly become rather notorious: but in justice to those who have sent in tenders for these works, I think it only fair to say that in many cases the plans and specifications are prepared in so vague and indefinite a manner as to account for very great differences in the estimates. In many instances which have come under my own notice, there have been no definite particulars as to the manner in which materials have to be laid down and consolidated, nor as to the quality, thickness, depth of socket, or mode of sighting, jointing, and laying drain-pipes, nor of the method of filling in, ramming, and formation of surface. It is no wonder in all such cases that very serious misapprehensions should occur, and I am often surprised that they are not more frequent.

There is no class of work which requires more strict and definite description than works of street-making and sewerage, as they are almost entirely covered in, and the first errors cannot be detected in time to be remedied by the contractor, even if he should be liable under the terms of his contract.

All works of a permanent character should be carried out in the very best manner, and of the very best materials; and it is simply an expensive economy to execute them in any other way. A liberal price should be given for such works; and the contractors, while they are entitled to have the fullest and most minute details of the work set before them, should also be bound to keep the work, when executed, in perfect repair for six months after completion.

THOMAS D. BARRY, Assoc. I.C.E.

ACCIDENTS.

AT Barking during a gale a large portion of the steeple of the parish church has been blown down. The north-east corner for about 12 ft. down was blown completely off, and fell through the roofs of the nave and north aisle into the church, while the peal of bells in the tower is covered by a portion of the rubbish. The steeple is very old, and has been cracked for some time. The damage amounts to several hundreds of pounds, and the repairs are entrusted to Mr. Scopes, Needham Market.

A portion of the Pier in course of erection at Eastbourne was blown down in a recent gale. The columns and girders for some 60 ft. of the pier had been completed, and 60 ft. beyond this another cluster of columns had been placed, but not connected with the other portion of the pier. The gale was so violent that these columns were torn up; indeed, some were snapped in two, and striking the girders, which had not been planked, hurled some into the sea, while others were bent, and hung over the head of the pier. This mishap will cause a considerable delay in the completion of the pier.

At the Paragon Stables, Paragon-street, Hull, the roof of one of the central stables has fallen in. The stable comprises two rows of stalls, and, fortunately for the horses (sixteen in number), the *débris* fell between the two rows. Thus the horses were all entirely uninjured. But two of the stablemen were found to be missing. One of them was afterwards dug out dead; the other fainted on being extricated. He was conveyed to the Infirmary. The accident was caused by the giving way of a wall which had become weakened during the recent stormy weather.

ZINC ROOFS.

SIR,—Will you or some of your correspondents kindly inform me "the best composition for covering over a zinc roof, which, from expansion and contraction, cracks and admits rain?

I have tried tar and sand, which partially answers, but believe I have read in some of your early issues of a composition which would form a coat of varnish on metal, impervious to rain, incombustible, elastic, inexpensive, and deadening the sound produced by heavy rain or hail-storms.

Any suggestions meeting these requirements will be welcomed by

ENGINEER.

THE ST. PETERSBURG EXHIBITION.

SIR,—In answer to the inquiry contained in your paper of December 18, regarding the St. Petersburg Exhibition, I beg to inform you that the Russian Consulate in London has received official notice that the said Exhibition will be a purely national one. There must, therefore, be some mistake in the American statement.

I have lately returned from St. Petersburg, where I have resided for a number of years; and should any of your correspondents desire to be informed as to the economy of the Russian Empire since the introduction of the vast reforms,—reforms which have changed entirely the former aspect of affairs in that country,—I shall be happy to correspond with them.

JAMES RUSHFORTH.

CASES UNDER THE BUILDING ACT.

NOTICE TO SURVEYORS.

ADIN SHEFFIELD, of East India Dock-road, Poplar was summoned to the Thames Police-court, Stepney, for having erected a building, two stories in height, intended to be used as offices, at Limehouse Dock, Emmett-street, Poplar, without having given notice to the District Surveyor, as required by the 38th sec. of the Act, the building being irregularly constructed (the same builder having also committed a similar offence in making alterations and additions to another building in the immediate neighbourhood of the above). The case was heard before Mr. Benson on the 18th ult. The defendant did not appear, and was convicted in the penalty of 5*l*. and costs.

David Allen, a small builder (also the owner), of Kirby-street, Poplar, was summoned for having built three houses at Goodliffe-place, Poplar, without giving the required notice. In April, 1868, notice was sent to build four cottages; two were carried up and completed, and the fees paid in the following October, the remaining two being suspended. Early in the present year the builder was especially told that a fresh notice would be required before he commenced the other two houses, when he informed the District Surveyor that it was not his intention to build any more. On the 2nd of December, 1869, the District Surveyor discovered three houses built adjoining the two for which notice had been given in April, 1868. This case was also heard before Mr. Benson, at the Thames Police-court, on the 18th ult., when the defendant was convicted in the penalty of 20*s*. and costs.

Irregular Building.—At the Clerkenwell Police-court, Mr. Charles S. Thompson, of No. 26, Clifton-road, Hornsey-road, was summoned by Mr. John Turner, the District Surveyor of the Eastern Division of Islington, for having erected at the rear of each of the three houses belonging to him in the Moray-road a building constructed contrary

to the rules of the Metropolitan Building Act,—viz., having walls only half a brick thick, and being covered with wood. Mr. Thompson did not appear. Mr. Cook, the magistrate, having gone into the case, made his order that each of the buildings should be amended, and awarded 22s. as costs.

Also Mr. Richard Huett, the *occupier* of a house situate in the Cambell-road, Seven Sisters-road, was summoned for the fees due to the District Surveyor for surveying the erection of the house he resided in, and which the builder had failed to discharge. The magistrate made his order that Mr. Huett pay the fees and 14s. costs.

THE PROPOSAL FOR WIDENING LONDON STREETS.

SIR,—The illustration to Mr. Taylor's suggestion was only intended to make plain his meaning as to the space gained. The architectural treatment of the buildings would be open to a wide range of choice in colonnade, arcade, &c., in various styles. The least satisfactory plan would be, I think, that proposed by Mr. Forbes. A row of houses supported only under their party walls would be anything but beautiful. With respect to girder construction being made conspicuous, it seems to me that in this or any other case the iron girder is so unmistakably and uncontrollably a thing of utility, it can never be prominently introduced with success in that ornamental art known as architecture.

As the fronts of the houses are already supported by concealed girders, it would be an unnecessary expense putting others. All that would be absolutely required would be the pushing backward the shop-front.

With regard to the objection that a covered way as proposed would result in the nuisance complained of in the case of the Quadrant, Regent-street, I do not think it at all a matter of course. The evil in the Quadrant was owing to its contiguity to the Haymarket slums; and whil t the Haymarket is a *gay* market, the neighbourhood will suffer, columns or no columns. In respect of the shops being darkened: in a similar case, the Rue de Rivoli at Paris, the evil does not appear to be felt, and certainly from furnishing protection from sun and rain, allowing ladies to alight under cover, &c., there would be compensating benefits.

Of course, Mr. Taylor does not pretend his proposition is without drawbacks. He only advocates it as the best way of solving a difficult problem. P. E. MASEY.

ACTION AGAINST AN ARCHITECT FOR ALLEGED NEGLIGENCE.

Andrew Armstrong v. *Alfred Jones.*—This was an action in Court of Exchequer, Dublin, to recover from the defendant, an architect and civil engineer of that city, damages for alleged negligence in preparing plans, specifications, and working drawings for, and in superintending the erection of, a dwelling-house and premises for the plaintiff at Temple-road, Upper Rathmines. The case was at hearing for several days.

Baron Fitzgerald, in the course of his charge to the jury, said that in substance the action was a complaint that the defendant had been guilty of a breach of duty. The defendant was employed by the plaintiff as an architect to prepare plans and specifications, and to superintend the execution of those plans and specifications, for the dwelling-house of the plaintiff. It appeared to him that when the defendant accepted this employment he came immediately under the obligation to exercise, both in the making of the plans and specifications and in the superintendence of the work, reasonable care, diligence, attention, and skill; and if there had been any default on his part in that superintendence, from which actual damage had arisen to the plaintiff, then the defendant was responsible. A very serious question arose upon the contract. It appeared that for the completion of the whole contract Mr. Bolton was to be paid 3,224*l.* 9s. 9d. The mode of payment was to be by instalments, but the right to receive any instalment could only be conferred on Mr. Bolton by the defendant's certificate, given under his hand, certifying that work had been done to the amount of 259*l.* at least. Then he was to be paid seven-eighths of the amount so certified. It was also provided by the contract that none of the certificates should be given unless the work was done to the satisfaction of the defendant, and in conformity with the contract. There was to be a final certificate, however, which would be conclusively binding on both parties—that was on Mr. Bolton and the plaintiff. The allegation of the plaintiff was that the defendant was responsible for want of due care, attention, and caution in the giving of these certificates. That allegation was the subject of the other three counts which they had to consider. The contention of the defendant was, that he was only to be held responsible for an honest and *bond fide* performance of his superintendence, not independent of care and skill. That appeared to him to be a question deserving of much consideration; but for the purpose of determining between the parties in the shortest and most inexpensive mode, he should ask them to treat it as that the defendant was responsible for the want of care, skill, and attention in the performance of his duty. If he was wrong in that he would be set right; but, in the meantime, he would ask them so to treat it. If they found that there had been want of reasonable skill, care, and attention in the superintendence of the works, then would arise the question of what actual damage arose to the plaintiff from this default of the defendant in this duty of superintendence. The measure of damages could not by possibility be what would be necessary to put the work in the condition required by the contract—that would be as against the party who was paid for the performance of the work; but now the damages should be measured as to what loss the plaintiff had suffered by reason of the negligent performance of his duty of superintendence. It appeared six certificates had been given—1st, 27th April, 1867, for 500*l.*; paid 437*l.* 10s. 2nd, 31st December, 1867, 500*l.*; paid 437*l.* 10s. 3rd, 1st February, 1868, 500*l.*; paid 434*l.* 10s. 4th, 5th March, 1868, 1,000*l.*: paid 875*l.* 5th, 11th April, 1868, 500*l.*; paid 437*l.* 10s. There were certified in all 3,000*l.*, out of which had been paid 2,265*l.* On the 9th of July, 1868, the sixth certificate was given for 500*l.* on the contract, and 300*l.* for extras, together 800*l.*, out of which the sum payable was 700*l.* Now, as to the giving of the sixth certificate, it was given *ultra vires*, and the plaintiff could have refused to pay it—he was not compelled by the powers of the contract to pay it. It would be almost impossible to say that the giving of the certificate was not a gross want of caution, and very negligent, to say the least of it. Now, the plea of the defendant was that this certificate was given by the leave of the plaintiff. It was a question whether this plea ought to have been allowed, but for the purposes of the present trial it was not necessary to consider it. It would be impossible to say that he did not pay this with full knowledge that 2,625*l.* had been already paid, and he or his attorney had the actual possession of the draught of the contract by which he was apprised that he was not compelled to pay, and yet he (Mr. Armstrong) made no complaint until February, 1869. He had now gone through the questions they had to try, and as they were as familiar with the evidence as he was, it was unnecessary for him to review it. His lordship then left the following questions to the jury—1st. Were the houses and premises at Temple-road in any respect built of inferior or insufficient materials, or erected in an unskilful or unworkmanlike manner, or permanently injured or diminished in value, or were any deviations or omissions from the plans and specifications made. 2nd. Were they, or any of them, made or done by the authority or permission, or by reason of want of reasonable skill, care, and attention of the defendant in his superintendence of the works. 3rd. The damage arising to the plaintiff from such default of the plaintiff in said superintendence. 4th. Whether the certificates, or any of them, were given to the builder in respect of works which were not done to the satisfaction of the defendant, or according to the contract. 5th. Whether the certificates, or any of them, were given to the builder without taking into consideration deviations and omissions made by the builder in the work, and without making any deductions in respect thereof from the unit mentioned in such certificate or certificates. 6th. Whether the giving of such certificate was by reason of the negligence and want of caution of the defendant in his duty of superintending the works. 7th. The damage thence arising. 8th. Whether the 6th certificate was given through negligence and want of due caution on the part of the defendant in superintending the work. 9th. Whether the plaintiff, with full means of knowing the default of said 6th certificate, acquiesced in and adopted the same.

The jury, after an absence of an hour and a half, returned, handed in a verdict, with an answer in the affirmative to each question, and assessing the damages on the 2nd and 3rd questions at 75*l.*, and on the 5th, 6th, and 7th questions at 5*l.*, with 6d. costs.

CAB MEN AND CAB STANDS.

IT appears to me that these hardly-used men might be kept out of the public-houses, if a small kitchen,—wooden houses on wheels,—were attached to each cab-rank; tea and coffee might then take the place of gin and brandy, and cost less. SPERO MELIORA.

CONCRETE BUILDINGS AND THE "INCLOSURE COMMISSION."

IN assenting to the grant of public money for the erection of farm buildings and labourers' cottages, the Inclosure Commissioners rightly feeling the importance of obtaining durable buildings for the heirs on whom the rent-charge would fall, have heretofore not considered themselves in a position to recognise concrete as a suitable building material. It may be of consequence to some of our readers to know that they have just now accepted as satisfactory a number of farm buildings, on a large estate, in Wiltshire, on the report of Mr. Godwin, whom they had directed to inquire into the subject, and who has also, at their request, reported on the general principle, and on such precautions as should be taken in dealing with future applications for leave to erect buildings of this nature. Great advantage would follow lessening the cost of healthful cottages, and we look on the use of proper concrete as likely in many districts, and under proper regulations, to effect this. The commissioners, by the step they have taken, show an enlightened willingness to go with the age.

THE DEAN OF GUILD COURT.

FALL OF A RAILWAY STATION AT EDINBURGH.

SIR,—Will you have the goodness to give a place in the first number of the *Builder* to this communication, which is intended to be an answer to a letter which appeared in the *Builder* of December 18, regarding the fall of a part of the Caledonian Railway Shed here, and in which the writer states this:—

"In my opinion the whole responsibility and the entire odium of the matter properly belong to a wretched remnant of municipal antiquity we have in Edinburgh which goes under the name of the Dean of Guild Court."

It will be sufficient to say that the jurisdiction of the Dean of Guild Court does not extend unfortunately to that part of the city in which the building is placed, and it has no control whatever on the buildings erected therein; its supervision extends over the ancient and extended royalty, the Canongate and Portsburgh only, and the Court can, therefore, be no more held responsible for the fall of the building in question than they could be for the fall of Babylon.

In a previous paragraph the writer narrates his belief to be,—

"That the cause of the accident was due neither to the iron castings which gave way, nor to the timber-work of the superstructure, but to the deplorably unsatisfactory character of the foundation. The whole thing is built, not upon sand, but upon genuine and unmistakable rubbish."

Now, if that was the conclusion he arrived at, he was bound to lay the blame—if blame there was—on the architect or engineer in charge; but he, prudently it may be, or for want of courage, does not do so, but goes out of his way to lay it on an institution of whose powers he appears to be ignorant.

Allow me to tell you something concerning the constitution of the Dean of Guild Court, as it will afford observers the assurance that the cheesemonger element, by which, from his readiness to entertain the idea, it is presumable he is pained, by a hereditary or more intimate taint, does not form any of its composition. It consists at present of the dean, who has been connected with plans and buildings for forty years; three trader councillors, builders, who are at the head of their profession in Edinburgh; two merchant councillors, one of them recently the chairman of the Chamber of Commerce, and the other a merchant; and one a writer to the signet,—seven in all. These members act gratuitously; they have no salary or fees; then there are two advocates, senior and junior assessors, who have salaries, and who sit in the court when legal points arise; but such points are rather of rare occurrence. Now, a court so constituted has evidently within itself the kind of knowledge which is required for dealing with the matters that come before it, and it has been found both useful and effective, and would have been more so, if its powers were more ample than they are. It has now subsisted for more than four centuries, and it must have had much that was good and necessary in it; and were it superseded,—say, by handing the jurisdiction to the sheriff,—he will, in nine cases out of ten, have to call in experts,—perhaps the very men who act gratuitously now,—to assist him and report, and he and they will be paid handsomely, and the suitors will be involved in correspondingly large expenses.

ONE WHO KNOWS.

GREY HAIR IS NO ECLIPSE.

SIR,—Allow me to say a few words in behalf of our greyhaired artisans. There seems to be with a large section of employers of the present day a somewhat unaccountable aversion to them, an aversion that deserves censure.

Apart from the philanthropy of the subject, we deem it a duty to defend the fair fame, and to uphold the rights that belong to the aged; but more particularly so when the class affected has so strong a claim to advance in its favour as that of being the recorder of the architectural and engineering genius of the present century.

That the artisan should be despised for his locks having silvered with the years that gave him experience, and perfected him in the peculiarities of his art, appears rather anomalous, when we consider that in nearly all other professions the hoar of time is of itself an essential recommendation.

Often have we seen the young aspirant, with the theories of a hundred brains floating in his head, fall to zero when required to give those theories a practical turn; and often have we seen the unassuming veteran perform the most difficult undertakings with an ease and perfection that can only be acquired by lengthened experience. As a rule, the experience of the aged craftsman fully compensates for any defects in his movements; and his periodical returns of accomplished labour will hold no inferior place, when viewed beside the corresponding productions of his more youthful shopmates.

A CRAFTSMAN.

THE BLOCKADE OF FLEET-STREET.

INCOME OF THE MIDDLE TEMPLE.

SIR,—The congestion of Fleet-street continues, nay, increases, and the dangers of the middle passage are worse than ever. Nothing but a new street will ease the traffic. Now, it appears to me that the simplest and cheapest plan would be to make a broad, straight street from the foot of Blackfriars Bridge, through the Temple, to St. Clement's Church. This would relieve Fleet-street of all the traffic going westward from the bridge, and would be a shorter line than at present. As to the expense, it would be comparatively trifling, as the houses in Whitefriars

are of a very inferior class, and, as to the Temple, the land, in fact, belongs to the nation, the Society of the Temple paying an insignificant sum of 20*l.*, or something like it, as quit rent to Government; while the rental received by the benchers for chambers is something enormous,—amounting, according to the best information I can obtain, to about 13,000*l.* a year for the Middle Temple alone. For the sort of residences provided for the members of the Inn, let any one go and see the miserable dog-holes where they locate, and judge for himself. Besides this, every barrister called is a clear profit of 100*l.* to the society. What becomes of all the money? is a question that has often been asked and never answered; but we all know that when trustees receive large sums of money and do not account, imputations are not wanting. The whole thing is one of those vast corporation abuses of bygone times, which the ensuing Parliament must inquire into and reform. The immense sums now received from members were never intended to be squandered away in sumptuous feasts to illustrious strangers and the private friends of the benchers. RICHARD PATERNOSTER.

COMPETITIONS.

Madeley Union (*Shropshire*).—The Board of Guardians for this Union recently invited competition designs for a new workhouse, to accomodate 210 inmates, from nine architects having experience in the subject. The drawings were sent in under motto, on the 1st December, and on Friday, the 17th ult., the building committee selected the design designated "Idoneum," and elected its authors, the Messrs. Hadden, of Hereford and Great Malvern, "as architects for carrying out the proposed new workhouse."

FROM SCOTLAND.

Aberdeen.—An accident has happened at Ferryhill, Aberdeen, by which seven men were injured, three of them very seriously. It appears that while a number of masons and labourers were employed with a contractor named Milne for the construction of an ice-house for Mr. Garron, Ferryhill, some of the supporting beams gave way without warning, and the building, which was just being completed, fell with a great crash. The ice-house was about 30 ft. high. The roof was all but flat, and the men injured fell, along with the roof, to the ground, and were more or less buried among the rubbish. They were extricated with all possible speed. The injuries of some of them were of a dangerous nature, but one received only very slight bruises. Another serious accident has since occurred at Torry, near the city. For the purpose of lifting the concrete blocks to be used in the new south breakwater, at the harbour, which is about to be constructed a little to the north of Girdleness Lighthouse, a travelling crane had to be erected. The contractors for the erection of this crane were Messrs. James Harvey, jun., & Co., engineers. With a weight of 17 tons the strength of the crane was tested by the contractors, and no symptoms of weakness, it is said, presented themselves. A similar test was going on, when one of the cross-beams supporting the platform on which the crane was erected gave way, and the machinery, accompanied by six men, who were employed on the platform testing the crane, were precipitated from a height of from 25 ft. to 30 ft. A member of the firm escaped without injury, and one of the unfortunate six men who fell among the *débris* received only a slight wound on the side of the head. The others were all more or less seriously injured.

Elgin.—When the side windows of the parish church of Elgin were filled with ornamental glass in summer, four memorial windows for the east end of the building were not ready. They have now reached Elgin, and two of them have been put into their places. The ornamentation of the whole is Classical, in harmony with the style of the church, which is of Greek architecture. The ground-work is grizaille. The grounds of the bordering and leading forms are deep ruby, and blue; and the ornaments and labels, with inscriptions, are relieved in light tints of gold and white, turned up with light green, purple, &c. The glass is rough, and crystalline in texture. The two upper windows are in memory of General Alves, a distinguished soldier, who was much attached to his native town of Elgin, and who left a sum of money to erect a memorial of himself in the parish church.

Dundee.—A Unitarian church and schools are being erected at Constitution-road, from the designs of Mr. Alexander Johnston, of this town, architect.

Caputh.—The parishioners of the parish of Caputh, to perpetuate the memory of their late minister, the Rev. R. H. Scott, have erected over his grave in their burying-ground a monument of Aberdeen granite. The complete monument is 9 ft. 4 in. high, and consists of a carved cross. The die contains, within the outlines of a shield, the simple inscription. The monument was executed from an original design by Mr. Hutcheon, of Aberdeen.

Books Received.

Papers read before the Associated Arts' Institute. AN interesting *brochure*, consisting of papers read during the past session, 1868 9, by Messrs. R. Westmacott, Soden Smith, R. Redgrave, H. Ellis Woodbridge, W. Cave Thomas, Montgomerie Ranking, and Lemon H. Michael. It is edited by Mr. F. Scarlett Potter, who acts as secretary of the Institute. On the 9th, a paper "On the Cultivation of Artistic Feeling," is to be read by Mr. H. E. Woodbridge.

Midsummer Eve: a Fairy Tale of Loving and Being Loved. By Mrs. S. C. HALL. Hotten, Piccadilly. 1870.

MR. HOTTEN has published a beautiful edition of Mrs. S. C. Hall's charming "Midsummer Eve." It is illustrated with no fewer than 200 engravings from drawings made by Maclise, Stanfield, E. M. Ward, Elmore, Frost, Noel Paton, Hulme, Goodall, Thos. Landseer, Creswick (now, we regret to say, no more), and other well-known eminent artists. The story is one of the most elegant and fanciful that its admirable author has written, full of human sympathy and wholesome teaching. It would be a good thing if the hanging-committee for each year at the Royal Academy could be made to read its closing chapters. It is a beautiful gift-book, and can scarcely fail to be long regarded as such. The volume is dedicated to the author's old friends, Sir Thos. Duffus Hardy and Lady Hardy, whose recent elevation in social position gratifies all who know them, and can appreciate worth and talent.

VARIORUM.

IT is of very little use just now, with hard frost dominant, to say that tourists will find "Bemrose's Guide to Derbyshire, a complete Handbook for the County," a very good one. Still, as the publishers now send it out, we will not withhold that opinion. The editors of it, Mr. J. Hicklin and Mr. Alfred Wallis, have evidently taken much pains, and have made it more than an ephemeral companion. It includes a number of very good illustrations.——Sprague's "Diary, with Tables for Architects, Surveyors, and Builders," is a capital little pocket-book for its purpose. We do not pretend to have checked the correctness of the tables and calculations. A list of the District Surveyors, under the Metropolitan Building Act, has been added.——"The City Diary and Almanack" (W. H. & L. Collingridge) contains, in addition to the matter ordinarily given in a diary for the desk, a large mass of official information with regard to the City, not to be found in any other publication. It is a complete guide to the various business offices of the Corporation and City generally. There is ample space for daily entries, upon good paper.

Miscellanea.

Commencement of the Sittingbourne Water-works.—The great depression in the brickmaking trade in this neighbourhood has thrown a large number of labourers out of employment, and produced great distress and want. To alleviate this to some extent, the local sanitary committee have urged on their arrangements, and obtained the authority and sanction of the Secretary of State to go on with the work, as also to borrow a sum not exceeding 5,000*l.* to defray the cost. There are now upwards of 100 able-bodied persons in receipt of relief from the public rates, amounting to about 8*l.* per day, which, it is hoped, will now be utilised to the ratepayers by the commencement of this work, which will be carried out under the superintendence of Messrs. Easton, Amos, & Anderson.

Architectural Society of Northampton. The ordinary meeting of the committee was held on the 13th ult., the Rev. Lord Alwyne Compton in the chair. A sub-committee was appointed to advise upon the best manner of laying out any money which may be contributed towards the restoration of Earl's Barton Church,—a desire having been expressed that the Architectural Society will undertake the supervision of the work. The chairman stated that a meeting of the committee for the restoration of St. Sepulchre's Church had been held, when it appeared, from the report prepared by the secretary and treasurer, that, assuming the correctness of the estimated expense, it will be possible to complete the works, and to clear off all the debt on the former work, by an expenditure beyond what is already promised in the way of subscriptions, of about 700*l.* The debt for which the members of the original committee are responsible is about 1,000*l.* The committee, therefore, determined to obtain tenders for the work, as they feel that the subscriptions already announced are not likely to increase till the committee commence some part of the work. The report of the sub-committee on the plans by Mr. Slater, for the restoration of the churches of Bozeat and Strixton, was read and adopted.

The American Railroad Style for India. A small item of news from India, remarks *Chambers's Journal*, has occasioned some sensation in the engineering world. The Governor-general, Lord Mayo, has sent to the United States for an engineer accustomed to the rough-and-ready way of constructing railways in that country, and at a cost far below that which an English engineer would consider possible. India is yet in want of thousands of miles of railway; and if, by Lord Mayo's experiment, they can be made cheaply, the benefit will be great to all concerned, including English engineers, who may perhaps learn a useful lesson therefrom, and lay down cheap railways in Australia. By the way, Australia has offered to supply the Indian government with all the horses required for their army at 25*l.* apiece.

Mechanical Puddling.—Messrs. Witham, of Leeds, appear to have devised a mode of mechanical puddling by which all the really heavy work is done by the aid of mechanical appliances. The new furnaces, too, work with about 13 cwt. of coals, compared with 20 cwt. for the same kind of work in the best-constructed furnaces of the common description. Each of the patent furnaces is worked by two men, opposite each other; but by means of the mechanical arrangements at the top the men are enabled to move their rabbles into all parts of the furnace, with comparatively little trouble, and with nothing like the ordinary amount of manual labour. The *Iron Review* says that a considerable number of these furnaces will be erected before long in the North of England.

The Consumption of Gas.—It is commonly supposed that the amount of illumination obtained from gas is in exact proportion to the quantity of gas consumed. The investigations of Professor Silliman, of New York, however, go to show that the amount of illumination is increased far more in proportion to the gas expended, as it increases according to the square of the volume of gas. Thus, if twice the quantity of gas be burned, the illumination ought to be improved fourfold. If three times the quantity of gas be used, the illumination ought to be nine times better. Professor Silliman is, we believe, the sole authority as yet for these conclusions; but he has a high reputation in science, and no doubt his experiments will be rigidly tested.—*Daily News.*

Discovery of Ancient Greek Liquid Measures.—An interesting and important archæological discovery has been made at Gythio, in Lacedemonia, consisting of a cube-fashioned stone, with five conic apertures, corresponding to the five well-known liquid Greek measures, of which hitherto all but the respective volume was known. To remove every doubt, the margin of each is inscribed with the corresponding designation.

Gas Explosions.—Two alarming gas explosions have just occurred, one at Great Yarmouth, and the other at Bury. The explosion at the former place completely destroyed a large steam ropery, and severely injured three of the workmen. It was caused by leakage of gas and incautious use of a candle. Two men were also considerably burnt by the explosion at Bury.